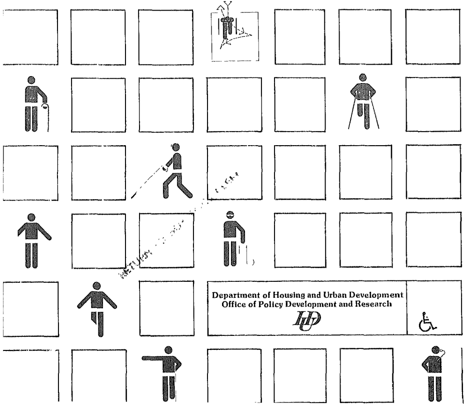
access to the environment

Case Studies of Barrier Free Sites

Volume 2



Department of Housing and Urban Development
Office of Policy Development and Research

ACCESS TO THE ENVIRONMENT

A Series of Reference Documents on the Design and
Development of Site Facilities to Make Them
Barrier Free to the Physically Handicapped and Disabled

Volume 2

Case Studies of Barrier Free Sites

prepared by the

American Society of Landscape Architects Foundation

under contract (H-2002-R) with

the

Office of Policy Development and Research
Department of Housing and Urban Development

and the

Architectural and Transportation Barriers
Compliance Board

HUD Contract No H 2002 R

The research and studies forming the basis for this report were conducted by the American Society of Landscape Architects Foundation pursuant to a contract with the U S Department of Housing and Urban Development (HUD), Office of Policy Development and Research The statements and conclusions contained herein are those of the contractor and do not necessarily reflect the view of the U.S Government in general, or the Department of Housing and Urban Development or the Architectural and Transportation Barriers Compliance Board in particular Neither the United States, nor the Department of Housing and Urban Development nor the Architectural Transportation Barriers Compliance Board make any warranty, expressed or implied, or assume responsibility for the accuracy or completeness of the information herein

This is a part of the summary publication of the research and development contract (H-2002-R) between the American Society of Landscape Architects Foundation and the Office of Community Design Research, Department of Housing and Urban Development. This publication is supplemented, in fulfillment of the contract obligations, by an 80-page document excerpting the major findings of this study and entitled "A Guide to Barrier-Free Site Design" and by two other volumes of the series of reference documents.

ACCESS TO THE ENVIRONMENT

Volume 2

Case Studies of Barrier Free Site Designs

Item	Page
Introduction	1
Housing Case Studies	7
San Antonio Public Housing Authority	7
Victoria Plaza	7
Parkview Apartments	10
Blanco Apartments	12
Villa Tranchese	13
Walter B. Roberts Manor, Omaha, Nebraska	14
Independence Hall, Houston, Texas	16
Highland Heights, Fall River, Massachusetts	19
Vistula Manor, Toledo, Ohio	23
Campus Planning Case Studies	27
University of Missouri, Columbia, Missouri	27
University of Michigan, Ann Arbor, Michigan	32
University of Illinois, Champaign, Illinois	35
St. Andrews College, Laurinburg, North Carolina	40
Transportation Case Studies	42
Highway Rest Stops Designed for Handicapped Travelers	42
Playground Case Studies	44
Colonel Wolf School Playground, Champaign, Illinois	44
Carrie Beusey School Playground for the Handicapped, Champaign, Illinois	47
Magruder Environmental Therapy Complex, Orlando, Florida	49

Item	Page
Therapeutic Play Facility, Palo Alto, California	53
Jessie Stanton Developmental Playground for Pre-School Handicapped Children, New York City	57
Recreation Case Studies	63
Trout Pond Recreation Area for the Handicapped, Tallahassee, Florida	63
Will-A-Way Recreation Area, Winder, Georgia	68
Pine Glen Campground, Mammoth Lakes, California	74
Scented Garden, Missouri Botanical Garden, St. Louis, Missouri	79
Garden of Fragrance, Strybing Arboretum, Golden Gate Park, San Francisco, California	80
Three Senses Nature Trail Fountains, Paint Pot Scenic Drive, Yellowstone National Park, Wyoming	82
Whispering Pines Nature Trail, San Bernardino National Forest, California	84
National Childrens Forest, San Bernardino National Forest, California	87
Tibble Fork Facility for the Handicapped, Unita National Forest, Provo, Utah	90
Trail for the Blind, Muir Woods National Monument, near San Francisco, California	94
Trail for the Blind, Petersburg National Battlefield, Petersburg, Virginia	96

INTRODUCTION TO VOLUME 2

The following are a series of case studies of either proposed or constructed site facilities throughout the United States which have been made relatively barrier free either in their initial design or in their re-design These are representative of a wide variety of other projects throughout the United States This is not a complete listing of all of the facilities which exist These shown are illustrative of the basic concepts revealed in the course of this larger study Many of these case studies integrate a number of individually designed site elements These particular projects are those which could be located and photographed within the time and budgetary constraints of this research project They illustrate the principles of planning total areas for use by the disabled There are other barrier free sites, of course, being developed continually throughout the United States in all geographic areas and at all scales Possibly an ongoing methodology needs to be developed to continue the collection of case study material and actual examples where sites have been designed or altered to be fully accessible to the total population These particular ones, however, are illustrative of the principles and do show the concern of not only designers but of administrators and public officials in providing accessibility for all

INTRODUCTION TO THE SERIES

Convenient access to the outdoor environment is frequently denied to many people in our society because of the manner in which outdoor elements are designed and constructed Every person can expect to be physically handicapped either temporarily or permanently at some time during their lifetime A mother pushing a baby carriage, a shopper whose arms are loaded down with packages, a child pulling a wagon, and a pregnant woman may find themselves unable to cope with a flight of stairs, a curb, or a door because of the design of these objects

These people may expect to be relieved of their handicaps within a fairly short length of time, unfortunately, there are those who, through a permanent handicap, will always be inhibited in their movements

The total number of permanently disabled people is growing dramatically The primary reasons for this are better medical treatment and care, and as a direct result of this, increased longevity. With people living well into their seventies, eighties, and nineties, it may be expected that the opportunity for a traumatic injury or a debilitating disease during their lifetime is greatly increased Also, the wars that have occurred in our recent history have created large numbers of disabled people

In the past, the basic attitude of the general population towards those with various disabilities was, "Out of sight - out of mind " Current attitudes place more emphasis upon encouraging disabled people to lead more productive lives and to avail themselves of educational opportunities Concomitant with this, a national effort is being made to employ the handicapped. This, of course, requires that those with disabilities must be able to go easily to a place of education or employment However, while barrier free architecture, at least in public buildings, is becoming a reality through federal, state, and local codes and legislation, provisions to assure barrier-free site design have for the most part been neglected This inadequacy has not been as intentional as it has been accidental Standards, details and other design configurations which have limited the accessibility of impaired people in the exterior environment, have usually been in common usage for years, and simply have not been examined as to their appropriateness

Most landscape architects and other environmental designers desire to make their designs accessible to the handicapped, but must be made aware of the standards and guidelines that are necessary to do so At present, the individual designer asked to design facilities for the disabled person has few ready sources of reference Although much work and study has been done on the subject by government agencies on state and local levels, independent institutions, and a number of design firms, the work is so scattered as to be of little use There has been a need for the development of a centralized reference for the sharing of basic resource material for the design of site facilities

This publication is a compendium of the materials and information gathered under that contract A briefer document, Barrier Free Site Design, available through the Superintendent of Documents, U S Government Printing Office, has been prepared as a summary of the study, for easy reference

The purpose of this publication is to provide for landscape architects and the designers a complete manual showing how to design a barrier free environment, and to provide administrators sufficient background material and to judge wisely the construction requirements for outdoor design.

This document contains information on how site elements such as walks, seats, steps, railings, planters, drinking fountains, lighting fixtures, play equipment, waste receptacles, signage and other outdoor design elements may be and have been designed and located so as to make them usable by the handicapped. It is also concerned with the combination and integration of these individual components with all the elements of site to form a totally accessible environment for all

It offers guidelines, criteria, details, planning considerations, relationships, studies and coverage of the interrelationships between site elements, architecture and transportation facilities and systems It does not deal with any of the interior aspects of the buildings themselves nor with the inside of vehicles or the actual transportation facilities themselves

STUDY PARTICIPANTS

The research and development of this publication was made possible by a contract (H 2002-R) between the Office of Policy Development and Research of the Department of Housing and Urban Development and The American Society of Landscape Architects Foundation The following organizations and individuals have contributed directly to the production of this publication

1 The Architectural and Transportation Barriers Compliance Board (A&TBCB) Washington, D C. The overall guidance and direction provided by members of the staff of the A&TBCB was essential in preparing the format and much of the content of these final documents Their unique viewpoint and perspective resulted in a study and a series of publications which were much more pertinent, succinct and more accurate and orderly than would have been the case without their guidance and assistance

2 U S Department of Housing and Urban Development Washington, D C. Special acknowledgment and appreciation must be expressed to staff members from the offices of Community Design Research, Equal Opportunity and Special User Needs Research/Policy Development and Research, Special Concerns/Housing Management, and Office of Programs for the Elderly and the Handicapped, for their insight, perception, and guidance, as well as their valuable input and review data submitted throughout the course of the research and development phase of this project

3, American Society of Landscape Architects Foundation McLean, Virginia. Mr. Gary O. Robinette, Executive Director

As project director, Mr. Robinette was responsible for coordination between the many parties involved in the production of the publication and was responsible for much of the development as well. Research Associates for the A S.L.A. Foundation were Mr. Jay Jorgensen, A.S.L.A. representative on the Architectural Barriers Committee of the President's Committee on Employment of the Handicapped, and Professor Alan Winslow, Director of the Department of Landscape Architecture at Virginia Polytechnic Institute and State University. These gentlemen provided the basic data from which the design recommendations and guidelines were established.

4 Johnson and Dee Landscape Architects Avon, Connecticut Mr Richard K Dee, Principal in Charge

The firm of Johnson & Dee was assigned responsibility for the "translation" of raw research data into the final printed book for Barrier Free Site Design As the supervising partner, Mr Dee was assisted by Mr Gary Hath, Ms Jacqueline McBride and Mr Christopher Nothstine

5 At several points during the course of the study, the material gathered to that date was presented to panels of reviewers for their comments on its completeness, accuracy, and appropriateness These panels consisted of designers, administrators, persons with specific handicaps, educators, and members of both public and private groups organized to represent handicapped persons nationwide,

Review panels have included representatives from the Federal Government Offices listed below and the following people

U,S Department of Housing and Urban Development
  Community Planning and Development
  Housing Production and Mortgage Credit
  Policy Development and Research

U S Department of Health, Education and Welfare
  Bureau of Education of the Handicapped
  Rehabilitation Services Administration
  Office of Facility Engineering Property Management
  Social Security Administration

U S Department of Transportation
  Urban Mass Transportation Administration
  Office of Service and Methods Demonstration

U S Department of Agriculture
  Forest Service

Richard Austin, Kansas State University

Richard Blakeley, University of Wisconsin, Department of Landscape Architecture

Paul Carr, The Community Group Corp,

James Gashel, National Federation of the Blind

William A. Hillman, Jr., Bureau of Education for the Handicapped, Division of Training Programs

Jorry Hitzhozen, National Recreation and Park Association

Dean Johnson, Johnson and Dee, Landscape Architects

William Kirwin, Smith/Kirwin

Marcia Lacy, Psychiatric Institute of America

Edmond Leonard, President's Committee on Employment of the Handicapped

Harriet Miller, N R T A - American Association of Retired Persons

Donald Molnar, University of Illinois

Robert L O'Boyle, Robert L O'Boyle Associates

David Park, National Recreation and Park Association

Julian Stein, American Association for Health, Physical Education and Recreation

Frederick C Terzo, The Rouse Company

Thomas B Thompson, Architectural Consultant

Robert Van Beck, National Easter Seal Society for Crippled Children and Adults

Doris Wright, The Community Group Corp.

Robert Zolomij, University of Illinois

Special thanks must especially be expressed to all of the organizations, agencies, individuals, and offices which so generously provided research data and material These are unfortunately too numerous to mention individually.

STUDY BACKGROUND

Purpose of Study

The purpose of these publications is to provide in one source, for both administrators and designers, the necessary information that can lead to designs that consider all persons using the outdoor environment These are not intended to present rigid guidelines or standards, but rather that they should act as a means of sharing information and experience This is an assembling of much of the research data and material gathered in the course of this study

This document is meant to be used as a tool for design and evaluation and for promoting and assisting further research by administrators, landscape architects, architects, engineers, handicapped people with an interest in accessible exterior facilities, maintenance personnel, other concerned groups, research organizations, students, and all people interested in a totally barrier free environment

It is hoped that it will assist anyone who may be inadvertently preventing handicapped people from enjoying total access to the environment because of a lack of knowledge of pertinent guidelines or details

Content of Study

The information presented within these publications relates to the following areas

1. The status of federal and local legislation, standards, guidelines and criteria, both past and present, in making the exterior environment more accessible. A profile of current legislation and requirements enacted by individual states is provided in Volume 3

2 The relationships of the costs in providing barrier-free access for both existing and proposed construction

3. Details of how site elements such as steps and ramps, seating, handrails, parking stalls, waste receptacles and site lighting may be designed so as to be usable by the handicapped. Guidelines, planning considerations, and coverage of the interrelationships between site elements, architecture, and transportation systems are included The document does not deal with the interior aspects of buildings nor with the actual systems of transportation since much has already been published and distributed on this area of interest Neither does it deal with handicaps of such severity that the individual is completely unable to use the outdoor environment without a great deal of assistance

4. Case studies of actual examples of sites which have been either designed originally or modified to accommodate persons with limitations, handicaps or disabilities.

5 Finally, suggestions of where to look for additional information, the names of organizations, agencies, institutions, publications, and people or projects that have been helpful during the study are listed at the end of this publication

Study Methodology

The methodology for this study included the collection of information concerning the limitations of persons with various handicaps, the study of physical constraints manifested by various disabilities, and the gathering of details and planning studies which have been related to making the exterior environment more accessible to the disabled After the basic standards, guidelines, details and site plans were gathered, they were compiled, organized, edited, and were then supplemented by papers and documents prepared by various designers, recreational therapists, and other specialists who served as consultants to this study This material has been assessed, appraised and altered where necessary by representatives of design organizations, governmental agencies, and groups representing handicapped populations in informal review seminars conducted as part of the study.

In addition to the information presented in this publication, a digested report was developed as a part of this same study and is entitled "Barrier Free Site Design " It is available through the Superintendent of Documents, U S. Government Printing Office, Washington, D.C. (Stock No. 023-000-00291-4, $2 30)

Definition of Terms

For the purpose of this study, it has been necessary to define particular handicaps, impairments, and restrictive devices so that they may be related to individual design elements. The terminology used below, with the exception of "temporary impairments," is generally accepted and used in literature dealing with handicapped.

1. Temporary Impairments

Temporary impairment refers to any and all situations in which people become temporarily restricted in their movements either through a disease or trauma that requires time to heal, or simply in performing the normal functions of everyday life. The pregnant woman, the shopper with his arms loaded with packages, the skier with a broken leg, and the woman wearing high heel shoes are all "handicapped to a degree" in their movements, but the duration of their impairment is relatively short-lived.

2. Activity Impairments

The term activity impairment generally refers to any sort of limitation which curtails the normal activities of a person. Most often diseases of the heart, lungs, or forms of arthritis and rheumatism are involved. Visual, audial or mobility curtailment are not included In general, people with activity impairments cannot play strenuous games or engage in unlimited physical activity

3 Mobility Impairments

It may be caused by such things as partial paralysis which has not been compensated for by the use of ambulatory aids, or the absence of extremities which have not been replaced by mechanical aids Disabilities, deformities, or handicaps which curtail the movement of the person are included in this category

SAN ANTONIO PUBLIC HOUSING AUTHORITY PROJECTS
San Antonio, Texas

The San Antonio Public Housing Authority of San Antonio, Texas, has provided a large number of excellent examples of site planning around housing to insure access by disabled persons who incidentally might also be elderly There are a number of recurring motifs in these projects of the San Antonio Housing Authority Among these site design elements in housing for the handicapped and elderly are the following

1. Walled courtyards Nearly each of these projects provides walled and protective courtyards which are also shaded and which allow for a confined place for outdoor activity for the residents In some cases this includes shuffleboard, sitting areas, game tables, outdoor eating areas, etc These quite often are shaded and nearly always have their primary access from inside the building with some incidental access out on the site

2. Nearly all of the sites are accessible to the surrounding areas and activity

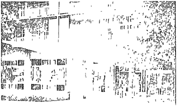
3. Nearly all have covered or canopied entrances

4. Nearly all of them have dropped curbs at the major entrances

5. Nearly all of these San Antonio Projects have ramps with railings at the minor or secondary entrances

6. Waiting areas for all the bus lines have been altered or the projects have been cited to take advantage of existing city bus lines and covered sheltered waiting areas are provided on the street very near the entrances to the building

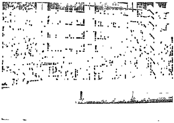
7. Nearly all of the projects have railings or hand rails at the front entrance from the drop off point from the automobiles leading to the front entrance of the building

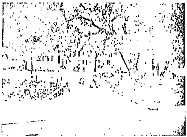


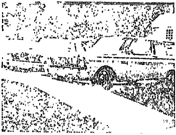
VICTORIA PLAZA

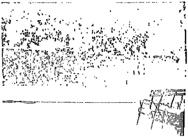
Victoria Plaza is a high rise building not far from downtown San Antonio and the site of the 1968 Hemisfair The project is approximately 15 years old and therefore the planting on the site is reaching maturity The maintenance of the project is extremely well done and the project has received wide publicity over the years Among the significant points in providing access for disabled persons at Victoria Plaza includes the very carefully designed lowered or dropped curb at the front entrance On the circular entrance drive leading to the front entrance a six-inch traditional curb is blended into the sidewalk so that at the front entrance itself there is no curb to impede progress of persons in wheelchairs, on canes or crutches The canopy from the building extends out to the driveway area thus providing either shaded or sheltered access from the automobile to the building The cantilevered canopy is held up by a series of three columns On either side of these columns is an aluminum handrail which is supported by an upright between each of the canopy support posts This railing provides a source or means of support for elderly or disabled persons moving from the automobile to the front entrance There is a covered bus waiting area a very short distance from the front entrance on the street for easy use by the residents in getting around the city. There are heavy pre cast benches in this waiting area which is open on two sides and has pierce concrete block on one side with a brick wall on the other This allows for easy surveillance of the bus waiting area as well as providing windflow through the bus stop area thus making it relatively cool and pleasant for the building's residents as they wait

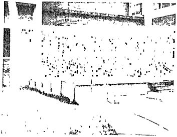
All of the secondary entrances both to the site and to the building have ramps with railings At the rear of the building is a clinic with a library for use not only by residents of the building but others from the local area There is a ten foot wide ramp with railings on one side leading to the clinic library wing There is extensive shade not only throughout the site but especially in the protected courtyard area for extensive use of the site in this extremely hot climate of the San Antonio area The protected courtyard immediately outside of the building is surrounded by a brick wall eight feet high which is covered by ivy On the outside of this wall is a major piece of monumental sculpture and brick planters On the inside of the ivy covered wall there is a ceramic mural, a pool, and an extensive paved area which is punctuated in some places by large shade trees There are extensive benches, chaise lounges, tables and chairs throughout the paved area for use by the local residents There are, as well, shuffleboard courts painted onto the floor

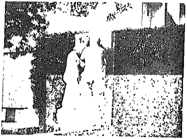


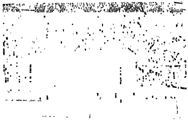








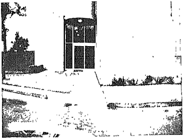


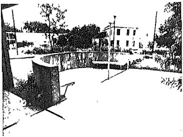


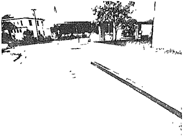
PARKVIEW APARTMENTS
San Antonio, Texas

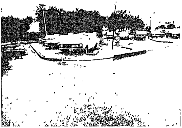
The Parkview Apartments in San Antonio are a contemporary high rise, cast in place concrete building of extremely striking appearance The building is on a large site directly across the street from a very large public park The site is also adjacent to other housing projects for the elderly managed by the San Antonio Housing Authority

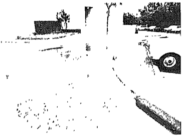
There are a number of distinctive site design features on this particular project There are raised curbs around the parking area which are cut at points of pedestrian access The sidewalks and street pavements are at the same level and are divided by a cement curb raised approximately six inches above both surfaces In order to provide for the needs of the handicapped, the projecting curb is simply cut so that wheelchairs may pass through There is an extensive curb cut of approximately 100 feet at the entrance to the building There is also a covered canopy of curbed concrete at the entrance to the building, a distance of approximately 100 feet There is protected seating in a waiting area immediately adjacent to the entrance to the building It is protected by a low curbing, cast in place concrete wall There is an outdoor seating area immediately out of the back of the building This particular outdoor sitting area has lower walls than do the other housing projects for the elderly managed by the San Antonio Housing Authority. This is obviously done in order that the residents can sit on the terrace and look across the street to the large public park and the activities taking place in it The service functions are separated from the main entrance. The site is well planted and even though the project is extremely new, there is a provision made for shade trees on the outdoor sitting area





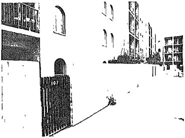


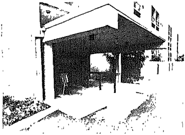




BLANCO APARTMENTS
San Antonio, Texas

The Blanco Apartments in San Antonio follow the apparent formula used in other housing projects for the elderly in San Antonio There is a dropped or cut curb at the entrance which extends from the concrete slabs on either side of the entrance There is a canopied entrance from the front entrance drive to the building entrance which in this case is approximately 25 feet There is also a double railing forty two inches high from the entrance drive to the building entrance itself to assist in the support of persons with mobility problems There are individual walled courtyards outside each ground floor unit for these particular apartments There is planting and a small sitting area inside each of these walled garden areas There is also a walled centered court in the back of the L shaped building There are also balconies for each apartment unit There are precast parking blocks in the parking lots with curbless entrances from the parking lot to the building itself The site is well planted, but there are not enough benches in the interior court even though the tops of the raised planters were designed as seats All of the walkways are extremely wide to provide full access to persons on crutches or in wheelchairs

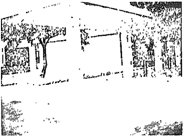




VILLA TRANCHESE
San Antonio, Texas

Villa Tranchese is located on a large site which is well planted and well maintained The site is close to nearby shopping and all of the curbs surrounding the site have either dropped curbs or curb cuts in order to provide easy access for the residents from the site to the surrounding areas. There are two parking lots on the site The one in the front is smaller, largely used for visitor parking, and the one in the rear is larger, used primarily by the residents of the building The service to the site is at the rear of the building and does not interfere in any way with the movement of the residents into the building

This particular housing for the handicapped and elderly seems to conform very clearly in site design to the San Antonio formula. There is a covered canopy over the entrance walk which is of cast-in place concrete, supported by four concrete columns. On either side of these columns is an upright support to give stability to the railings There is a dropped curb which is discontinued at the entrance, giving easy access between the entrance drive and the entrance walk In this particular case there is also an enlarged entry platform on either side of the entrance walk adjacent to the driveway walk There is also, in this case, a vine covered wall surrounding a court which is paved and which provides outdoor sitting and recreation area for use by the building residents. Inside this court are benches, tables, and other outdoor recreational facilities

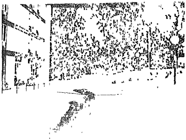


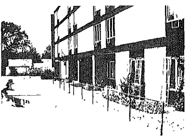
WALTER B. ROBERTS MANOR
Omaha, Nebraska

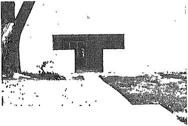
One of the seven buildings HUD has helped develop thus far which were designed wholly or in part for occupancy by handicapped or disabled persons is the Walter B. Roberts Manor in Omaha, Nebraska. This project for the blind consists of forty-two units. The construction, development and management of the project was sponsored by the local association for the blind. Though the building is not design modified in any extensive way to accommodate blind persons, there are certain provisions in the site and the site development which have materially assisted in the use of the site either through its location or through development of site elements which make it much more usable by blind persons and provides prototypical solutions for possible application in other locations.

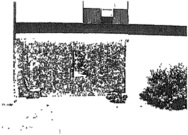
The site of the building is immediately next door to a city park. By paving a walkway from the building into the park itself which comes out one side of the building, it has been possible to provide ready and easy access to picnic tables, sitting areas and to an outdoor barbecue facility in the park itself. This provides an opportunity for residents of the building and their guests to utilize the city park. The project is immediately adjacent to a residential area. The entrance drive is at the end of a dead end street, and though the building itself is somewhat below the surrounding area, it has been possible to connect the entrance walk to the building to the sidewalks in the surrounding neighborhood. The curved entrance drive has a sidewalk alongside it. This walk, from the entrance to the site to the front entrance of the building, has on one side a pipe railing (42 inches off the ground) which provides a handrail for the blind persons as they either approach or leave the entrance to the building. The entrance driveway has, at the entrance to the building, been adjusted with a rolled curb which provides much easier movement and access from the automobile to the front entrance without having to step over the typical six-inch curb.

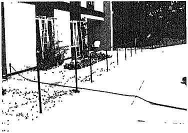
The building has, as well, a canopy over the front entrance for protection of persons entering or leaving the building in inclement weather. It also removes any danger from ice and snow at the front entrance during the cold winter season in the Omaha area. At either end of the building there is a covered and shaded outdoor sitting area for use by the residents. These areas are furnished with lawn chairs and swings. Out of one of these outdoor sitting areas is the major entrance to the adjacent park. The service to the building is completely separated from the front entrance, thus negating any problem of conflict between the residents and servicemen entering or leaving the building.







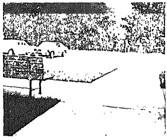




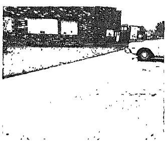
INDEPENDENCE HALL
Houston, Texas

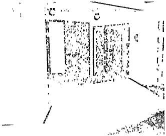
This project is a 292 unit housing project of two stories placed on a ten-acre site Perhaps the most striking aspect of this particular project is the fact that on the entire ten acre site at ground level there is not a single change in grade There are elevators in the building at either end of the project and major ramps in two interior courts

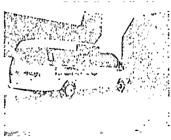
This project is a garden-type project of interconnected buildings in the form of three diamonds linked at their sides This project is operated by the Goodwill Industries of Houston and is managed in staff by persons with handicaps or disabilities. By providing bumper blocks rather than curbs as dividers between the parking areas and the surrounding sidewalk and by very careful grading and drainage, it has been possible to provide absolutely no steps, curbs or other changes in grade on the first-floor level on the entire ten acre site. This is an excellent study in grading and drainage and indicates very careful review by the site designer to accomplish this and still get the water on the site to drain adequately so as not to provide standing moisture or water at various places on the site. The bumper blocks are placed at twelve-feet on center and provide a six-foot opening in between each of the bumper blocks This will prohibit car wheels from moving between the blocks and yet will allow persons on walkers, canes, crutches, or in wheelchairs to move between the blocks from the parking area onto the surrounding sidewalks.

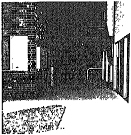


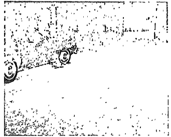
Many of the major entrances on both the first and second level are with doors opened with pressure-activated doormats. There are railings on either side of these doorways There are a number of benches both on the interior courts and on the walkways surrounding the buildings on the site. There is not enough shade provided around these benches in order to make them usable in the warmest season of the year in the Houston climate. There are very few mature plants on the site and there is a great need for vegetation of screening and for shade purposes. It is extremely interesting, also, that the site is so barrier free that the standard barrier free symbol is not used anywhere on the outside of the buildings.

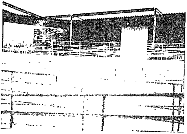


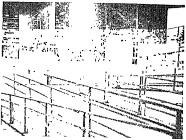


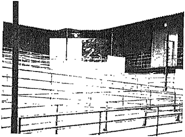


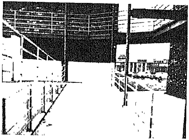








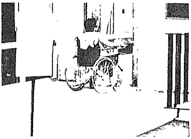


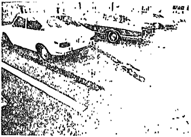


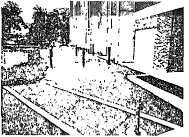
HIGHLAND HEIGHTS
Fall River, Massachusetts

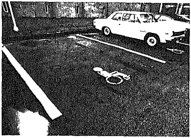
This project is a 208 unit highrise building on an extremely large site   The project is adjacent to a city hospital and is connected by a partially underground walkway   There is currently hospital staffing for the building clinic   The site is large, and many of the existing mature trees have been left on the site The site is on somewhat of a hill, giving a good vantage point for viewing the surrounding community to the residents of the area   It does provide somewhat of a deep slope for the residents to climb back to the building after shopping at the neighborhood stores or alighting from public transportation.

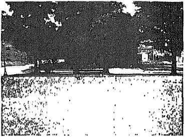
The auto entrance to the site is through the building. This provides a covered, protected entranceway into the building and an area to alight from the automobiles which is protected from the elements. There is a modified, rolled curb at the entrance to the building from the driveway   The service entrance to the building is separated from the main entrance, thus precluding any interference between the handicapped or elderly residents and delivery or service vehicles. There are also in the parking lot designated parking spaces identified with large, stenciled white symbols A sunken garden is provided immediately in front of the building which is accessible from the basement. The basement itself is opened up to this sunken courtyard all along an entire wall   This gives a protected area which is completely accessible from the building and yet is not visible to persons passing by the site or the building   There are also large paved areas outside the building with benches for recreational activity   These areas are on the same elevation as the main floor of the building. The existing shade trees which are preserved on the site have been utilized since benches have been placed adjacent to the paved walkway under the shade trees   There are pressure sensitive pads used to open the main entrance door on the first-floor level

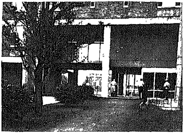


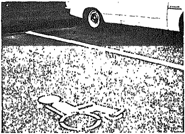


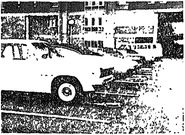


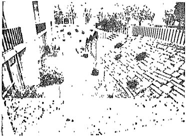


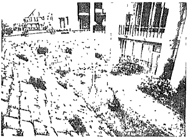


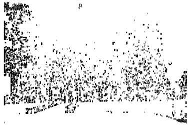


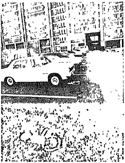


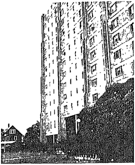


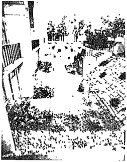








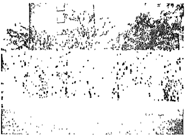


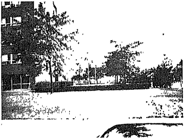


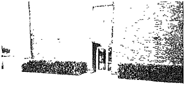
VISTULA MANOR
Toledo, Ohio

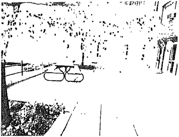
This is one other of the seven housing projects HUD has helped develop which have been designed wholly or in part by handicapped or disabled persons. This project is a high-rise building on a large, open site near downtown Toledo. Bus service is provided on the street immediately in front of the building. There is a glassed-in bus waiting area immediately outside the front entrance. The site is across the street from the Goodwill Industries shop and store. It is also across a major highway from other housing units for the elderly, managed by other groups.

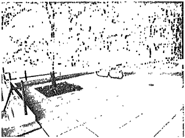
There is parking provided under one wing of the building for residents of the building. There is also other parking provided on the site near the building. At either end of the building there are raised, protected outdoor eating and recreation areas immediately outside the exit doors. In the recreation area, benches, tables, and shuffleboard facilities are provided. On the other side of the building is a sitting area which is provided with outdoor picnic tables. Both of these areas are screened with planting and have provided extensive shade trees for summer usage of the area. There is also a row of benches and a double row of shade trees down one side of the site along the public sidewalk. The basement entrance into the building connects the underground, covered parking area with the building itself. This entrance is fully accessible and has a symbol to indicate it on the door. It also has a row of benches and a wide walkway which provides for wheelchair sitting under the covered structure. The main entrance to the building is close to a major street and has pressure-sensitive door openers and a symbol of accessibility. It does not, however, have a canopy over the entrance, though the actual doors are recessed somewhat into the building itself.

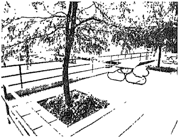


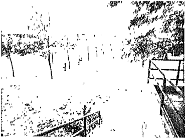


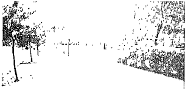


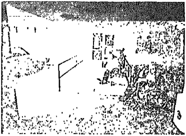


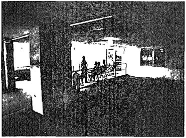


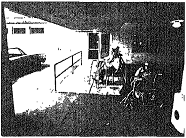


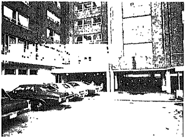












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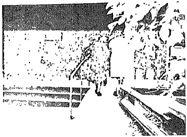
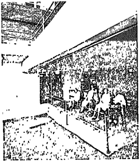
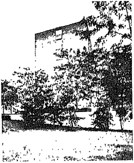






THE UNIVERSITY OF MISSOURI
Columbia, Missouri

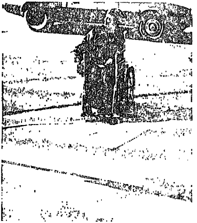
Summary

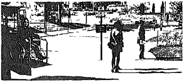
The University of Missouri at Columbia is an example of an entire campus made accessible to the handicapped, largely through the modification of existing buildings and grounds. The needs of students and staff in wheelchairs have been given special consideration. Ramps have been installed, a system of special signs and path identification devised, and a bus system for the handicapped initiated. The footabll stadium has been adapted to accommodate those in wheelchairs. Curbs have been cut or dropped throughout the campus.

Bus System

A bus system for the handicapped runs throughout the campus. Buses are equipped with forklifts which will pick up students in wheelchairs at the curb and lift them into the bus.

At each bus stop, an extra lane allows the bus to pull out of traffic to allow time to load and unload without impeding traffic. All stops are marked by signs indicating "handicapped bus loading." Photographs show a student in a wheelchair being unloaded from a bus.

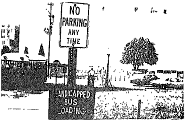


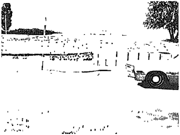


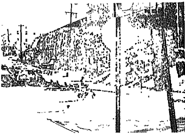
Signage

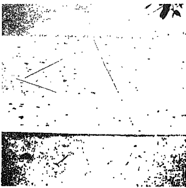
The international symbol for wheelchair bound persons is used throughout the campus to indicate the pathway and critical points for the handicapped

Yellow lines and yellow arrows are used to indicate appropriate points for crossing grade changes and traffic routes All dropped curbs are marked by this yellow painted arrow point









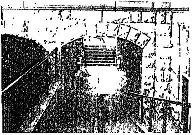
Building Access and Ramps

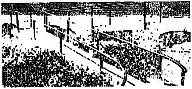
Every building on the campus has been made accessible, through at least one entrance, to the wheelchair bound. Both the doorways and the areas immediately surrounding them have been modified

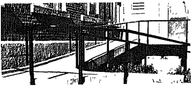
Each building has been dealt with individually, and steps have been eliminated or a ramp installed to make entry possible

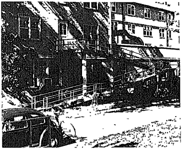
In some cases, simple temporary wooden ramps were used In other cases, a complex system of ramps was built at considerable cost

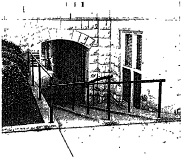
Photographs show some of the entries made accessible.





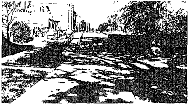






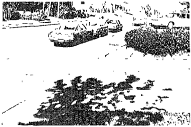
Dropped Curbs

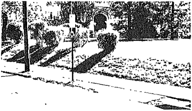
Curb cuts or curb alterations have been made throughout the campus Essentially two forms of curb cut have been used one is a straight curb cut with ramping, the other is an offset dropped curb and ramp Photographs show several varieties



Sidewalks and other pathways throughout the campus have been made passable for the handicapped Permanent ramps may be either integral or additive, temporary ramps may be stationary or portable

It should be noted that the ramps have made all pathways easier to traverse by bicycle This has both positive and negative aspects - while serving a large number of students, a conflict is created between the various wheeled vehicles the slow wheelchair and the much faster bicycle

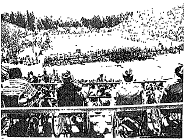


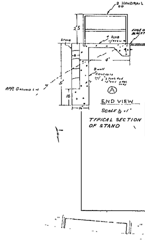


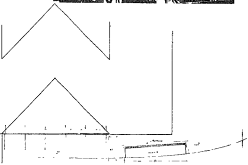
Stadium Accommodation

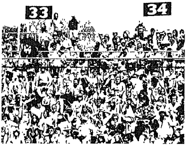
The football stadium at the University of Missouri has been adapted to make it possible for persons in wheelchairs to be pushed up ramps into the stadium and placed in a specially redesigned and constructed area immediately adjacent to the scoreboard

This area, built with concrete railings, is level and has no seats, especially designed for the chairbound









UNIVERSITY OF MICHIGAN
ANN ARBOR CAMPUS
Ann Arbor, Michigan

A Survey of Accessibility

To make the Ann Arbor campus accessible to the handicapped, the Plant Department began, in 1969, a concerted effort to identify and eliminate architectural and environmental barriers As a first step, a survey of 34 buildings on the central campus was made.

Following this survey a total of 25 buildings were made totally or partially accessible. In addition, seven totally accessible buildings were constructed In 1970, a long range program to eliminate all architectural barriers was undertaken Another survey was taken in 1973 A total of 191 buildings were evaluated For the purpose of this survey, accessibility was divided into two parts and each building evaluated in regards to these definitions

Accessibility to buildings was defined as the availability of at least one accessible entrance from walk or plaza level to any floor where one elevator stops, thus making other floors accessible The accessible entrance may be an exterior door with a 32-inch opening or a similar door in a common corridor with an accessible adjacent building The approach to the entrance must be level or a walk with a five percent slope.

Accessibility to facilities was defined as facilities that can be approached, entered, and easily used by the physically handicapped persons These facilities would include sanitary facilities, telephone booths, water fountains, stairs, handrails, doors, door-knobs, knurled door handles, raised signs, room identification in braille, desk counters, corridor dimensional restrictions, library aisles and furnishings

From these definitions Mr George Selin, Sr Civil Engineers, Engineering Services at the University, developed a system of five classifications for the buildings to indicate the degree of their present and potential accessibility.

A Presently Totally Accessible Buildings Indicates that the building has at least one accessible entrance to a floor where the elevator stops, thus making all other floors accessible.

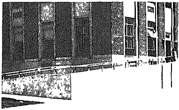
B. Presently Partially Accessible Buildings Indicates that there is a part of a floor or floors which is inaccessible because of existing steps or steep ramps or lack of an elevator.

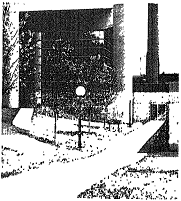
C. Presently Totally Inaccessible Buildings Indicates that the building is totally inaccessible.

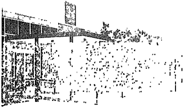
D Potentially Totally Accessible Buildings Indicates that one of the buildings presently in Class B or C has the potential to be in Class A after some renovation

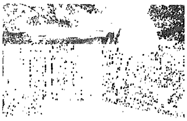
E Potentially Partially Accessible Buildings Indicates that any of the buildings presently in Class C has the potential to be in Class B without the installation of a new elevator or without unnecessary costly renovation

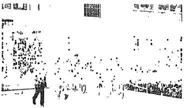
Using this information, it became possible to evaluate the costs and benefits of modifying each building, place them in priority, and make a long term budget

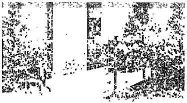


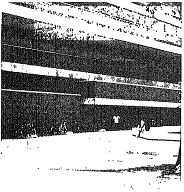


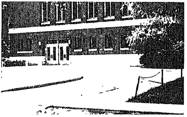




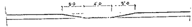




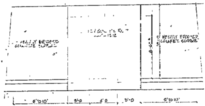




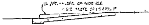
Curb Cut for Straight Sidewalk "Type A"



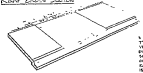
Front View


Heavily broomed concrete surface
1:12 slope
Heavily broomed concrete surface
5'-0"
5' to 10'
3'-0
4'-0
3'-0
5' to 10'

Ramp Plan View



Ramp Cross Section

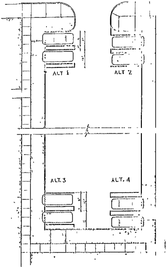


Ramp Perspective

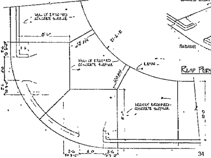
* This dimension is based on a 7" curb and a conventional reverse slope of 1/4" ft. For different curb heights or sidewalk slope this dimension should be changed accordingly so that the ramp slope is not greater than 1:12

Parking Layouts

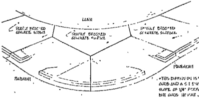
Scale: 1" = 20'-0"



Curb Cut for Intersection Corners "Type B"


Heavily broomed concrete surface
8'-6"
Heavily broomed concrete surface
Lawn
21'-6" R
Heavily broomed concrete surface
Down
Down
10'-0
2'-6 to 3'-0"
4'-0
2'-6 to 3'-0"
2'-6 to 3'-0"
4'-0
2'-6 to 3'-0"

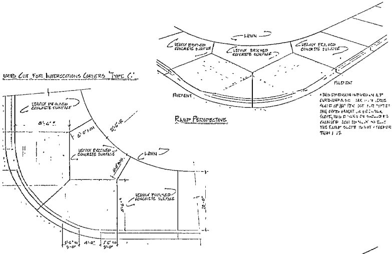
Ramp Perspective


Lawn
Heavily broomed concrete surface
Heavily broomed concrete surface
Heavily broomed concrete surface
Pavement
Pavement

Ramp Plan View

*This dimension is based on a 7" curb and a 6' sidewalk with slope of 1/4" per foot. For different curb heights or sidewalk slope, this dimension should be changed accordingly so that the ramp slope is not greater than 1:12

URB CUT FOR INTERSECTIONS CORNERS 'TYPE C'

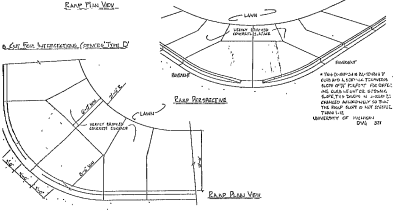

LAWN
HEAVILY BROOMED CONCRETE SURFACE
HEAVILY BROOMED CONCRETE SURFACE
HEAVILY BROOMED CONCRETE SURFACE
PAVEMENT
PAVEMENT
HEAVILY BROOMED CONCRETE SURFACE
8'-6" *
6'-0" MIN
21'-6" R
HEAVILY BROOMED CONCRETE SURFACE
LAWN
4'-0" MIN
HEAVILY BROOMED CONCRETE SURFACE
8'-6" *
20'-0"
3'-6" TO 9'-0"
4'-0"
3'-6" TO 9'-0"

RAMP PERSPECTIVE

RAMP PLAN VIEW

* THIS DIMENSION IS BASED ON A 7" CURB AND A SIDEWALK TRANSVERSE SLOPE OF 1/4" PER FOOT. FOR DIFFERING CURB HEIGHT OR SIDEWALK SLOPE, THIS DIMENSION SHOULD BE CHANGED ACCORDINGLY SO THAT THE RAMP SLOPE IS NOT STEEPER THAN 1:12.

B CUT FOR INTERSECTIONS CORNERS 'TYPE D'



RAMP PERSPECTIVE

RAMP PLAN VIEW

* THIS DIMENSION IS BASED ON A 7" CURB AND A SIDEWALK TRANSVERSE SLOPE OF 1/4" PER FOOT. FOR DIFFERING CURB HEIGHT OR SIDEWALK SLOPE, THIS DIMENSION SHOULD BE CHANGED ACCORDINGLY SO THAT THE RAMP SLOPE IS NOT STEEPER THAN 1:12

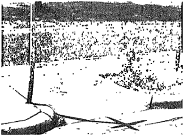
UNIVERSITY OF MICHIGAN
DWG 321

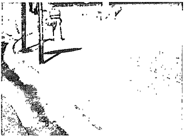
UNIVERSITY OF ILLINOIS
Champaign, Illinois

Summary

The university campus has been made fully accessible to the handicapped, with the needs of various groups considered. There has been some experimentation in forms and techniques for modifications.

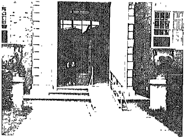
The constraints of the wheelchair have generally been the limiting factors in design.

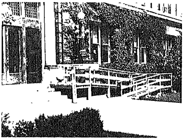




Curb Cuts

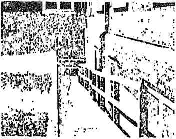
Curb cuts have been made at every intersection. A variety of styles and locations for the cut have been tried, so there is little uniformity. Some have been placed at the corner, others offset up to six feet.

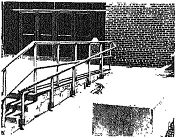




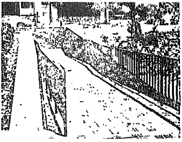
Width of the cut varies from 30" to 72". Each new cut is now adapted to the needs of the area.

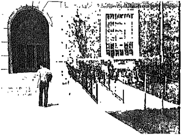
In general, the offset curb cut, slightly away from the corner, has been found most satisfactory. It is aligned directly facing another offset cut on the opposite side of the street. Where there is a median strip or island a cut directly through it, level with the street, has been aligned with the curb cuts.

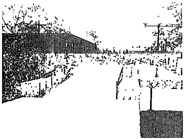




This alignment of the curb cut has been favored because it does not hinder the orientation of the blind. (The blind pedestrian anticipates a curb at the edge of the street, in the most direct line of travel, and without the curb may not recognize the edge of the street)







chair path, to stay within grade limitations, could only go into the street. The path area in the street right of way has been defined by pipe posts buried in the asphalt.

Services

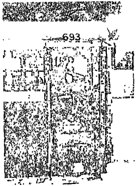
A transportation system of specially designed buses serves the handicapped throughout the campus. The standard type bus is modified by removing most of the seats, leaving an open space for wheelchairs. At the front door to the bus a special lift is constructed. As the bus pulls up to a curb the doors open and a hydraulic platform moves out and down until it rests flat on the sidewalk. A wheelchair is rolled onto the platform, locked into place, and is then raised up and into the bus.

Building Access

A survey was made of all academic buildings to determine the best available entry. For older buildings, a wooden ramp was built up to the entrance, and in one case, through the entrance doors and on up a flight of stairs immediately inside the door. In another case, the basement window well was used for construction of a ramp to gain access to the lower level. Where possible, permanent concrete ramps have now been formed next to the entrances.

The newer buildings of the campus are built with level entrances or the grade outside is built up to the doors to eliminate the need for stairs.

Access routes to each of the buildings are well defined with concrete walks. In one case, the wheel-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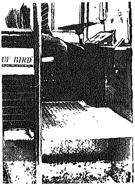

BIRD

ST. ANDREWS PRESBYTERIAN COLLEGE
Laurinburg, North Carolina

A College Campus Designed to Accommodate the Handicapped

Summary

One of the prime goals in planning the campus of St. Andrew's College was to make all facilities easily accessible to students with handicaps. Because this decision was made initially, no design modifications or additions were necessary, and it was possible to construct a fully accessible campus at a reasonable cost.

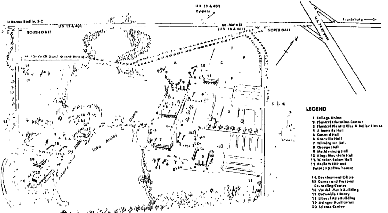
The campus is broken up into two basic units that are separated by a lake and connected by a causeway walk. One unit comprises the cultural, living and athletic buildings and the other unit is made up of the academic buildings. Thus the student needs to make no more than one round trip per day, and finds all his classes close together, and all evening activities close to the dormitory. With the advantage of designing the campus from the ground up, most buildings have grade level entrances and where grade changes occur between buildings, ramps have been incorporated into the site design and appear as an integral part of the plan. Several building entrances are equipped with electronic doors that slide open as pressure is applied to a pad in front of the door. Extensive use is made of various types of paving materials. Exposed aggregate finish which provides a non-slip surface is used on many of the ramps. In areas where steps are used there is always an alternate route by way of a ramp.

CAMPUS MAP

St. Andrews Presbyterian College

LAURINBURG, N C 28352

919/276-3652

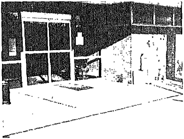


Office's Included in Liberal Arts Buildings

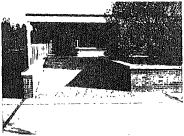
President
Dean
Business Manager
Admission Director
Registrar

In the College Union:

Dean of Students' Office
College Pastor's Office
Cafeteria
College Supply Store
Jud Shaw Snack Bar
Campus Post Office

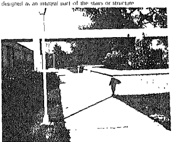


Level entrances at doors provide easy access into the buildings. Some are provided with electronic door openers

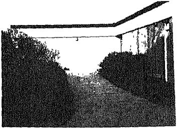


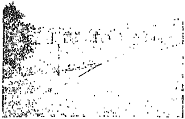
Exposed aggregate finish is used on some of the ramps to provide a non-slip surface and to indicate a change in direction or level

Whenever there is a grade change a person has a choice to either use a ramp or stairs. The ramps are designed as an integral part of the stairs or structure

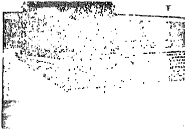


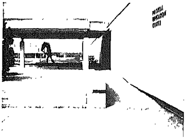
If the building entrance was not constructed at grade level, ramps were provided to get the wheelchair user up to the entrance. This was always done at one of the main entrances to the building. The next two photos illustrate ramped entrances

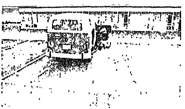




At all places where walks crossed the streets, curb cuts are provided. They are placed off center of the walk. This enables the blind person to continue to use the curb as a reference point for crossing the street





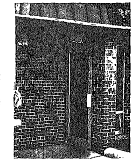


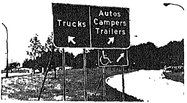
HIGHWAY REST AREAS DESIGNED FOR HANDICAPPED TRAVELERS

Summary

Automobile travel by the handicapped is the surest means of making them independently mobile. Many handicapped people prefer car travel because they can feel more at ease and encounter less physical barriers than by using public transportation. The Federal Highway Administration and the American Association of State Highway Officials are making sure that the newly constructed highway rest areas are designed to accommodate the handicapped. On every interstate system there are at least a few rest areas that have been made accessible.

The President's Committee on Employment of the Handicapped has put together a listing of rest areas that are scattered throughout the United States. Most of them are on the interstate systems. Each facility is listed by state, highway route, direction served and location. The following is a selection of such rest areas in various states.



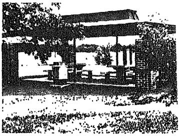


Minnesota

Interstate 94, South East of Fergus Falls

After turning off the interstate, the directional sign indicating which way to go also displays the international symbol. Directly in front of the rest room building a curb cut has been provided. The visitor can then travel on a concrete walk to the entrance. The entrance doors to both the men's and women's sides are full length glass with a flush threshold. One toilet stall has been made wider and provided with horizontal grab bars and outward swinging door. The room is large and spacious and allows for easy maneuverability for a wheelchair. Picnic shelters have been provided around the rest room building. Each shelter has an asphalt paved walk leading to it. The tables are concrete and can accommodate a wheelchair at each end.

This entire facility is highly accessible to the handicapped person, especially a wheelchair user.

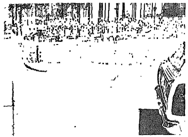


North Carolina

Interstate 95 at the North Carolina Virginia border

There is no indication at the interstate turnoff that these facilities are accessible, but once in the parking area, signs indicate special parking for the handicapped A ramp has been installed over the existing curb

The rest room is provided with wide doors and level thresholds A toilet stall at the far end of the room is equipped with grab bars and no door It is left open for view This is not a desirable situation The user of such a stall needs at least as much privacy as other people

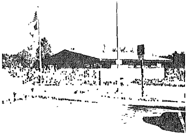


Iowa

Interstate 80

These rest facilities are similar at all Iowa rest stops along Interstate 80 Each facility has extra large parking bays and a curb cut centered between two bays A sign displaying the international symbol of access and the words "ramp" and "reserved" is posted next to the bays. A concrete walk leads to the building

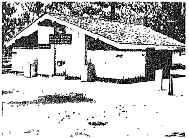
The rest room is spacious inside and allows for easy turning of the wheelchair. The end stall has been designated for use by the handicapped The door swings out. Grab bars are installed on each side of the toilet. A drinking fountain that extends out from the wall can also be used by a person sitting in a wheelchair The picnic areas are scattered around the rest room building, but one is required to travel over grass to get to them.



California

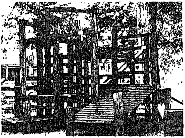
Interstate 395, near Mammoth Lakes Crestview Rest Area

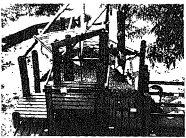
Located in the Sierra Mountains, this rest area reflects the atmosphere of its surroundings There are no signs indicating accessibility, but a curb cut from the parking lot is provided. The toilet stall is located at the end of the room and is partitioned off so that the stall occupies the entire end of the room This allows for ample room inside the stall to turn a wheelchair around The drinking fountains cannot be used by a person seated in a wheelchair

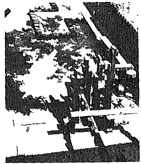


COLONEL WOLF SCHOOL PLAYGROUND
UNIVERSITY OF ILLINOIS
Champaign, Illinois

The Colonel Wolf School Playground was conceived, designed and constructed by the students of the Landscape Architecture Department of the University of Illinois The playground was used as a final project for a course study in design and construction The objective of the playground is to provide an environment for mentally handicapped, yet ambulant, children in which to (1) strengthen children's physical and mental abilities, (2) encourage and teach verbal communication and how to take instruction, (3) encourage children to do things on their own, and (4) reinforce and repeat lessons learned in the classroom



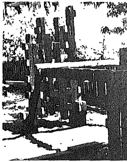


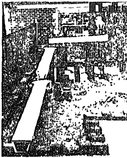


The playground is enclosed by a wire fence and is adjacent to the school building It is broken up into five basic areas, each area having a specific type of activity The first area consists of a wooden play structure made from a series of poles and platforms of varying elevations As the child works himself up from one platform to another, he eventually gains the top where he can either slide down a fireman's pole or work himself hand over hand across a ladder to another platform and a ride down a slide. The structure is painted with various shapes of different colors, a teaching carryover from the classroom

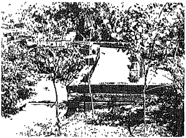
The next section of the playground is a combination of storage shed and tower A child can climb the side of the shed to the tower platform. From here he

a pulley assembly attached to a cable and
'own the length of the cable to the other end
ne is caught by an attendant or dismounts on
by way of a cut off stump This apparatus,
pointed out, is one of the best liked and most
tivities of the playground





ner section of the playground is a wood sculp
limber and a pool and sandpile, The connecting
etween sculpture and pool is a series of metal
ns, painted bright colors Water flows through
troughs, spilling from one to another until it
ually drops into the pool, This also was pointed
s one of the better-liked activities of the play
There is a maintenance problem with this par-
r area, as one can guess, with the combination
d and water,

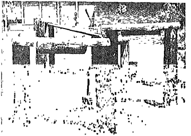


A tricycle track comprises the next section It is approximately three feet wide and paved with concrete At varying intervals along the track different textures and materials are applied There is a section of deep vee grooves, of brick paving, of metal pipes laid horizontally to the direction of travel, and round cylinders of wood Each texture or material gives the child a different feeling or sensation as he travels over them, The child starts the course at one end and weaves a pattern through mounds of earth planted with shrubs, He works his way up a ramp, over a large section of concrete pipe and down down the other side going over the brick, pipes, and wood, He then doubles back through the concrete culvert and back again

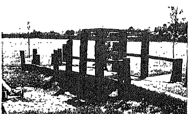
The last section of the playground is separated from the others by plant material and is used for more passive activities. A large cable reel table with blocks of wood for stools provides an area for games or lunches. A small patch of ground provides an area where the children plant vegetable seeds, care for them, and watch as they grow. The surface material for the play area is pea gravel, which dries quickly after rain storms and provides a relatively soft landing surface.

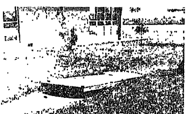
CARRIE BEUSEY SCHOOL PLAYGROUND FOR THE HANDICAPPED
Champaign, Illinois

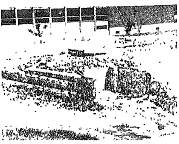
The playground for handicapped children at Carrie Beusey Elementary School was designed and built by two students of the University of Illinois Department of Landscape Architecture. The school is a regular grade school in the Champaign School District. Special classes have been set up for children who are handicapped both physically and mentally. The students come from a close geographical area comprised of several grade schools. As much as possible these special students are integrated into the regular school activities. It was found that the regular school playground facilities did not provide any recreational value to these students, so a special area was developed strictly for them.



The play area is located next to the school building in a grassed area bounded on two sides by the school. The play area itself basically consists of an obstacle course which the child in a wheelchair works himself through. The trail is approximately three feet wide and paved with asphalt. The child begins the course by going up a ramp which is bordered on both sides by telephone poles. He then crosses a small bridge and goes down another ramp. He goes through an opening composed of posts and logs. The first of these openings is built low enough that even a child sitting in a wheelchair is required to duck. The second is a little higher. He then encounters a maze which he works the wheelchair through. This maze is composed of telephone posts and plywood panels. Associated with the maze is an area in which ambulant children can climb several platforms, arranged in a circular pattern, with about a six inch rise between each platform. When the top is reached he can step off onto level ground and then walk down an earth mound.

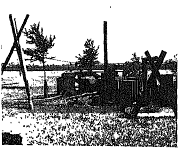






Further along the path the child encounters what looks like a teeter-totter set in the ground, which is as wide as the path The child wheels himself onto the teeter totter, as the weight of the chair reaches the center it tips down and the child rolls off and onto the path and continues on. This enables the child to control the teeter totter and work it back and forth. The sensation of movement experienced by a child on a regular teeter totter is achieved

The next area approached on the path is a mound of earth surrounded by logs with a recessed area that receives a wheelchair The child is surrounded on three sides by the earth in which he can play, dig, plant, or whatever. Integrated into the area also is a slide that is approached by climbing a series of varying height posts set in the ground. It was found, however, that not enough level area at the top was provided for The child has difficulty in maneuvering himself into position to slide down



MAGRUDER ENVIRONMENTAL THERAPY COMPLEX
FOREST PARK SCHOOL
Orlando, Florida

The Forest Park School is part of the Orange County Board of Public Instruction, administratively run as a regular elementary school. A board composed of civic and fraternal organizations directs and administers all charitable funds donated to the school.

As part of the school complex, the Magruder Environmental Therapy Complex (ETC) was conceived. Professor Leland Shaw from the School of Architecture, University of Florida, developed the design of the complex.

Need

The need for such a play area arose out of the need of the preschool physically handicapped child to develop his motor perception. Usually a child's motor development begins early in life. As a baby twists and turns in his crib, as he discovers his hands and grasps for objects, he learns what bulk and shape are. He then begins to manipulate and control his body and move about. As he moves in his small world he begins to perceive space and distance. As these skills becomes refined, the child's motor development increases and is refined. The levels of motor development have been defined and measured against established norms. The child's recollection and awareness of his motor development are called motor perception.

A child who is physically handicapped, depending upon his disability, has limited motor development. Because of his restricted movement he does not see the world and himself the way a normal individual does. His view of the environment is based on limited motor perception. He has not experienced the environment in a way that non handicapped have.

Goals

The Magruder Environmental Therapy Complex was developed to solve the problem of limited motor perception in handicapped children, outlined above. The ETC provides a play situation in which disabled children can function by themselves, regardless of the extent of their disabilities, and can have motor experiences comparable to those of non-disabled children. These experiences give the children a broader range of perceptual experiences and thus a fuller and more normal base for academic growth.

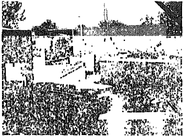
Before the ETC was designed, a set of perceptual goals desirable for full development of motor perception was put forth.

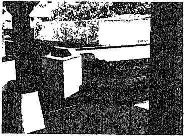
1. Body balance - dynamic and static
2. Body awareness self-awareness and body parts awareness
3. Laterality understanding of the body halves, right and left
4. Integration of body sides understanding of back and front, up and down, right and left externally in relation to the body
5. Directionality - movement in all directions from various planes of the body
6. Spatial relationships where one is in space, how much space one occupies
7. Depth perception accessibility of objects up and down in space
8. Linearity - following lines out in space, knowledge of remote spaces.
9. Tactile awareness the feel of things.
10. Kinesthetic awareness the feel of joints and muscle movement
11. Temporal awareness time required to get from one place to another
12. Spatial relationships of objects where one external object is in relation to another,
13. Judgment and decision based on the above, the ability to avoid objects as one moves in space
14. Motor planning a consolidation of knowledge of how to move efficiently in space.
15. Concepts about space the above experiences and the inner knowledge gained from them should bring about increased understanding of abstracts in formal learning

Design

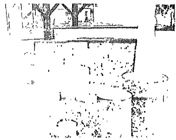
The ETC consists of an area approximately one hundred feet adjacent to the school building. About three-fourths of the area is covered with a roof truss system. The exterior limits of the play area are defined by a cinder block wall. Earth mounds form the outside edge of the wall. The wall is capped with a ten inch wide board which serves as a balance beam. The board is slanted in some areas to provide more of a challenge in balance. Inside the defined area, wood forms shape various elements of the environment, curving forms, slopes, planks, steps, cylinders, slides, and tunnels. The concrete floor is covered partly with carpeting, partly with shapes painted bright colors, and part is left natural concrete. Several features of the complex are movable so that the spatial relationships may be changed to create new situations and challenges for the children Free-standing walls and large cylinders help to create these spaces and passageways Large alphabet letters made of foam and covered with vinyl material can be moved about by the children and interlocked with each other At the entrance to the complex a small storage shed provides space for movable objects A seating area allows room to remove braces from legs and bodies before entering the complex. The major areas of the complex are as follows

Balance beam Proprioceptive information from the body segments as they are pushed and pulled against gravity in an effort to stay on the beam This equals kinesthetic awareness plus dynamic balance

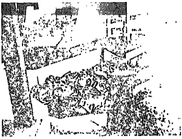


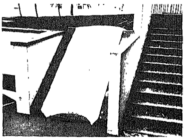


Step progression - Orientation change from a horizontal to a vertical plane in space, with a relationship to the self, and a basis for depth and height.

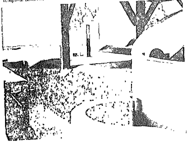


Foam Pit Motion in space, a dropping and landing, the reflexive movements of body sending kinesthetic information and tactile information via proprioception on a safe and soft landing, body awareness, internalized

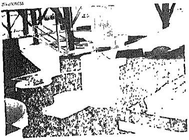


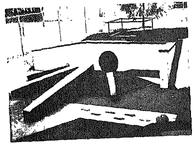


Slides - Movement on the diagonal from up to down, fast movement, body balance in motion - temporal awareness in accelerated motion



Rolling hills - Motion in space plus rotation of the self, reflexive patterns of arms and legs with tactile and kinesthetic simulation to reinforce body awareness



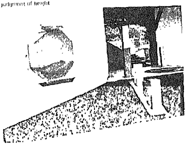


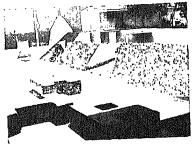
Mirrors - Visual images of the body in motion, clues by vision for motor planning

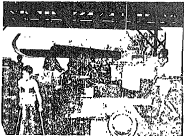
Free standing walls - The relationship of objects in space to the self, external spatial relationship which permit the judgment of distance or time in space, temporal awareness

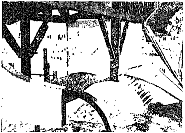
Overhead pull up - Movement in near space, grasp and release gravitational pull of body weight upward in space, information from proprioceptive and reflex mechanism giving tactile and kinesthetic awareness, also visual integration resulting in judgment of accessibility and integration of the body sides

Shelters or caves - An internalized knowledge of how much space the self takes, a spatial relationship developed from body awareness permitting judgment of height

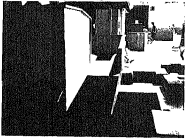








Up and down ramps of various pitches - Movement of the body weight up, crawling, scooting or climbing up in a prone position, a forward and upward pull against gravity, the kinesthetic and tactile feel of body pull and weight on the mode of body awarcness and integration of sides,



The bright colors, different symbols and shapes and the foam alphabet suggest a carry over of the class room learning process. A child is asked to go pick up the letter "M" or to move the red triangle box. This reinforces the concepts established in the school room

Another area is a cable slide that accommodates a sling type swing. An attendant is required to assist the child in mounting and dismounting the swing. It is one of the more popular items in the play area, along with the teeter-totter. The overall area required for the play area was approximately one hundred by one hundred feet. There are a variety of activities incorporated into the play area and most of them are designed so that the handicapped child could use them without assistance

THERAPEUTIC PLAY FACILITY COMMUNITY ASSOCIATION FOR RETARDED
Palo Alto, California

Preface

The design of therapeutic facilities for the retarded is not entirely a problem for architects and landscape architects it is largely the concern of experts in special education

The design objective is not merely full access, it is educational opportunity as well

This case study is presented to show some of the elements used in such therapeutic facilities, as well as the application of the principles of barrier-free design.

Goals

The Community Association for Retarded serves as a supplemental resource to the local and county schools in the training and education of the retarded The therapeutic play facility, which cost $40,000, was opened in April of 1972, Arutunian/Kinney, Landscape Architects of Palo Alto, were the designers The play facility augments the Association's overall program of a recreation and learning center, a swimming pool and a "respite" house, where parents can bring children for periods of two weeks in case of emergency The play facility serves children from pre-school age up through adults 40 years of age The concept of the facility is to provide an environment where the therapeutic, aesthetic and functional values of the retarded child and adult could be stressed. It provides an environment where the retarded can work and play together without the pressures normal children would exert on them Many retarded children have some physical disabilities that complicate their retardation The play area is designed to help them overcome these physical handicaps Educators believe that without a foundation in basic motor skills and abilities, more complex learning experiences are not likely to take place

The program for the play facility was outlined by the staff of C.A.R. and included the following criteria

A Body awareness and adjustment in space

B Solving an immediate problem in movement exploration by responding successfully to the demands of a situation

C. Developing perceptual motor coordination

D Achieving dynamic balance and gross motor coordination

E. Becoming aware of ability to cause something to happen

F. Developing strength and endurance

G Achieving group interdependence

H Achieving self confidence

Play Area

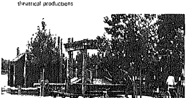
The equipment was to be designed for the maximum possible physical, mental and social emotional development of the retarded participants of all ages and varying stages of achievement Flexibility for future innovations and changing recreational needs was to be considered in the basic structure

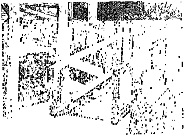
The play area is 120 x 120 feet, bounded on three sides by the swimming pool building, respite house and the community center The play structure is composed of three basic areas

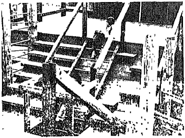
1. Fixed activity areas to accommodate daily training programs

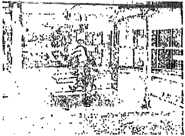
2. Flexible activity areas to accommodate current therapeutic programs and future program adaptations

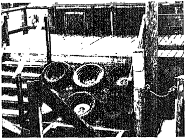
3 Social area to accommodate group activities and socializing such as dancing, cook-outs and theatrical productions

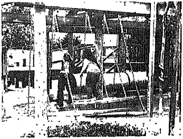


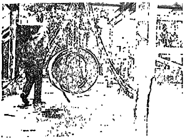




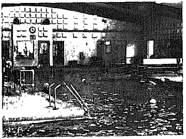








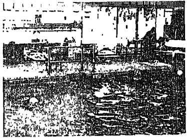
Incorporated into the play area are storage buildings to accommodate the various play equipment that can be moved about The buildings also act as part of the play structure. The sides can be climbed on and the roofs are decks and platforms The play structures are Douglas Fir poles with redwood decking, siding, roofing trellis members A one inch rubber mat is placed beneath the flexible area and in the maze area beneath the storage decks This provides a degree of safety should a child fall from the moving equipment or climbing apparatus Under the suspension bridge, deck and stage area a sand pit is provided. This not only provides a shaded play area in the sand but a safety feature, should a child fall There is a ramp designed to get a wheelchair child from the ground level up between the storage sheds, across the bridge and onto the stage. The area was not intended for heavy use by wheelchair users.

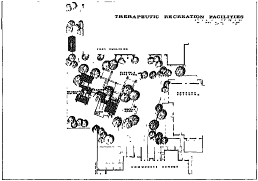


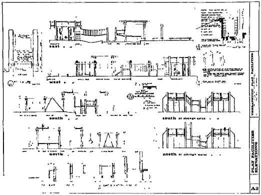
The social area is paved in concrete and accessible to the wheelchair It is also used to a great extent for a tricycle pathway The following photographs are views of the various elements of the play area There is adult supervision any time the play area is in use

Swim Center

Provisions for the physically handicapped have been made in the swim center. A wheelchair ramp allows wheelchairs down into the water Broad shallow training steps in the shallow end enable gradual entrance into the water Along the edge at several points, resting ledges, treading steps and teaching corners provide needed assistance in teaching the handicapped how to swim. The deck is radiantly heated and the air temperature is maintained at 86 degrees Dressing rooms and showers accommodate the wheelchair




THERAPEUTIC RECREATION FACILITIES
POOL BUILDING
SOCIAL AREA
COMMUNITY CENTER


east
west
south
north
south at storage units
north at storage units
THERAPEUTIC PLAY FACILITIES
PLAY FACILITIES ELEVATIONS
A2

JESSIE STANTON DEVELOPMENTAL PLAYGROUND FOR PRESCHOOL HANDICAPPED CHILDREN

This project was developed by the Institute of Rehabilitation Medicine, New York University Medical Center, through a grant from the U.S. Office of Education. The basic philosophy of the facility is best summarized in Rehabilitation Monograph 47, published by the Institute, entitled, "Design of a Pre-School Therapeutic Playground and Outdoor Learning Laboratory," by Ronnie Gordon, Assistant Professor of Clinical Rehabilitation Medicine, New York University Medical Center. Excerpts from the report are here reprinted.

"Effort had to be invested in the design and the provision of learning environments that would allow and encourage young children with restricted mobility, reduced stamina, depressed motivation and fear of failure to interact with more depth and vigor with people and objects in their world and to derive satisfaction and a sense of self worth as well as to develop new competencies from these interactions."

"It is an accepted fact today that young children learn most efficiently through 'doing.' Children are stimulated to 'do' only when it is within their physical and mental capacity to be effective as 'doers.' Modified and adapted environments that facilitate the effectiveness of handicapped youngsters are essential if we are to nurture the development of young children who can not successfully function in a normal environment. In these modified environments, challenge and sameness, excitement and routine have to be combined in a sensitive blend which invites independence and self assertive behavior in these children. Simultaneously, one must recognize and respect their age-appropriate dependence and need for support and comfort from both the physical setting and the adults who guide and often structure their learning experiences."

The educational philosophy behind the development of this playground was further outlined:

"Once again we were made aware that the exceptional child was doubly handicapped — handicapped experientially as well as by his primary disability. Our experience strongly suggested that few of the children who are confined to wheelchairs or restricted by orthopedic devices had access to or could use conventional playground facilities. It became quite evident to us that, if we were to assume responsibility for the education of young children in this Institute, we had to assume the concurrent responsibility of designing and developing a therapeutic playground — an outdoor facility where the space, equipment and activity areas were in harmony with and consistent with our educational goals and our deepening knowledge of the needs of very young handicapped children."

The conceptual basis for the development of this playground was amplified more fully:

"One cannot talk or lecture to young children about the characteristics of the outdoors. A child has to experience the characteristics of the outdoors in order to understand the mosaic of sounds, sights and textures that are the components of our natural environment. Even if one could describe adequately the many variations that exist in nature, a very young child will organize his perceptions of these phenomena only after it has a very personal meaning associated with his own experiences. For this reason, we are concerned about the development of children who are restricted by wheelchairs and by delays in their development and in their capacity to both 'take in' and integrate experiences."

The criteria for the selection of activity areas to be included in this therapeutic playground was summarized:

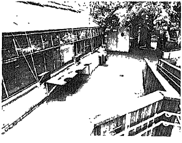
"If we subscribe to the thesis that young handicapped children require similar exposure — in fact, even more intensified exposure to experiences and activities that are pedestrian but crucial for young children in general, an outdoor educational facility should include the following: opportunities for larger motor activities, encounters with elements and media that are distinctive to the outdoors, and movement in a prescribed space that is less confining than an indoor setting. What do preschool aged children do outdoors? How do they move? What materials do they use?"

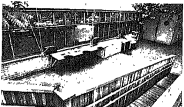
"The answers to the above questions, in a sense, were the determinants of the structure and design of our therapeutic playground. The repertoire of movements of young children includes reaching, grasping, releasing, pushing and pulling, and, at the same time, crawling, walking, running, and climbing. These motor skills evolve in a sequential pattern but are so expected in normal development that they are only momentarily acknowledged as they emerge in the growing child. For children with developmental disorders of neurophysiological origin the achievement of each or even one of these motoric milestones can be a monumental accomplishment. The ability to walk from one area to another does not develop in many orthopedically and neurologically impaired youngsters just because it is chronologically appropriate in the schema of normal growth patterns. It is developed as a result of high motivation, intensive effort and training."

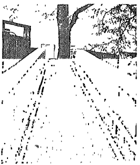
"Enhancing the mastery of skills is one of the primary objectives of those of us who have assumed some commitment for nurturing the development and maximizing the potential of handicapped children. The desire to reach, to grasp, or to crawl, to walk or to climb has to be instilled and supported by magnifying and continuously reinforcing the satisfactions to be derived from such activities. The pleasures and dividends of play have to be immediate and strongly experienced before many passive youngsters are willing to invest the unusual effort required of them to adopt the play mode of experiencing the objects in their physical environment."

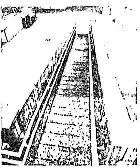
"Our experiences in the indoor infant and preschool learning laboratories strongly suggest to us the basic need for clear delineation of activity areas to facilitate the ordering and organization of stimuli for our young patients. Our children too frequently have problems with selecting from the barrage of co-existing stimuli available, those that are appropriate for their individual and particular stage of development and that can be assimilated into their growing body of knowledge."

"We concentrated, therefore, on four specific areas - each of which had implicit in its use a potential for refining motor activity while simultaneously offering varied experiences with natural materials that would add to the fund of precepts that the young child needs before he can sort, quantify, and qualify objects and materials in his micro-environments."





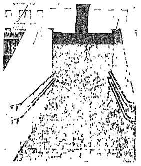




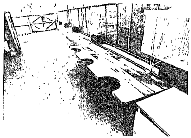
"1   The Bridged Treehouses

These structures offer an assortment of increasingly more difficult approaches and exits, accessible to children with varying abilities and rates of locomotion. Spatial relationships, heights, perspective, concepts of below, under, over, high and low can be explored with the teacher at the child's level of understanding in concrete terms of individual usage."

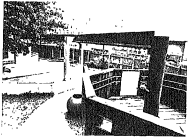
"Treehouses have been a part of the young child's world for centuries. And, their intrigue and excitement for young children is obvious. When one is very small, to be 'high up,' to be 'above,' to be powerful and big is implicit in being 'on top' of those who are below."



"To satisfy this desire, to give dignity to this type of motivation, required the design of a tree house that was functional for our exceptional children with their limited mobility and restricted motion. We believed that we had an opportunity to motivate children to walk if we could create a place to which they wanted to go. If our thinking was correct - that young handicapped children would be equally intrigued by treehouses - the design of this outdoor structure with modified approaches and exits would be the very incentive needed to foster and enhance their mobility and ambulation."



"The primary approach to the first house was as an elongated ramp slope at 10 degrees - an incline within the capability of young children wearing braces if they were afforded the additional support of handrails at appropriate heights. The width of the ramp was as critical as the slope since the extended reach of young children (between the ages of two to six years) had to be considered if the design was to be effective. It was soon obvious that one set of handrails would be insufficient to meet the needs of both two year olds and six year olds. Our design, therefore, included two sets of handrails at heights of 18 inches and 24 inches to maximize the possibility that children who could not walk without the use of parallel bars could master the gentle inclined ramp and reach their objective - the top of the first treehouse."

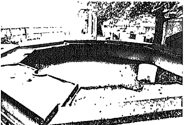


"Once the child was in the treehouse, a double row of handrails was provided to support his movement around the octagonal structure. 'Peep holes' were included in the design to allow for the child's comfort in that he or she could identify his position in space as well as check the immediate availability of an adult for assistance if needed."

"For the mobile child - one who could climb steps - an alternate entrance to this treehouse was available by ladder with six inch steps - dimensions deemed appropriate for the age range of children we service An additional three steps up and down lead to an eight foot bridge across the expanse that connects the second treehouse Once again the depth and height of the steps were specified and reflected our previous experience and that of our physical therapists who work with our handicapped children "

"The bridge across to the second treehouse opens further options for the more effective ambulator The youngster has available to him a gentle sloping fiberglass slide that leads to a grassed surface below, adjacent to a pathway that leads to another part of the playground "

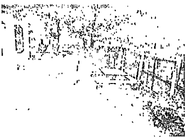
"The bridge connecting the two treehouses, while encouraging mastery of steps, simultaneously provides the overhead structure of a tunnel. This underpass is available to those children who can move their own wheelchairs or can be wheeled, crawl or walk on a pathway directly below the bridged treehouses While the elevation of the treehouses was carefully limited to a height that would accommodate the elongated ramp, the ladder, and the gently sloped slide, additional attention had to be directed toward designing the bridge at a level that would allow for clearance underneatn for the adults who often assist the children in their movement as well as by children using their variety of orthopedic devices and vehicles "



"2. Foam and Sand Pits

For those children whose disability has so restricted their movement that they are unable to walk or to sit alone without support, there is a specific area - a foam mattress, where the child can be prone but can still experience the sensation of open space, can see a sky instead of a ceiling, can become aware of clouds and of a tree responding to winds can observe the play of other children as they interact with each other and different pieces of activity equipment."

"Adjacent to the foam pit is a large sand pit, at ground level, with handrails along the perimeter to help youngsters maintain balance as they get into and out of the area independently "

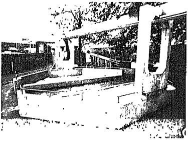


"The foam and sand pits, an innovation seldom found in any other such playground, were outlined and described in the Rehabilitation Monograph as follows

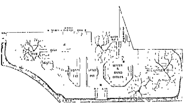
"The children serviced at this rehabilitation center are so diverse in their disabilities and abilities that areas had to be reserved for the range of movement - space in which to simply enjoy the pleasures of the outdoors "

"To this end, we designed a foam mattress pit where a child could lie - prone or supine and still be attracted by and reach for stimuli that could be hung overhead on a series of carrier and pully lines connecting adjacent areas The other half of the pit construction is an area filled with sand and used as a conventional sandbox for those children who can crawl into or be placed into the sand pit These children require effective trunk control to maintain a sitting position independently "

"The external cement boundary of the pits has vertically extended handrails parallel to the top surface to assist new walkers in their independent exploration of this portion of the playground The handrails were constructed of stainless steel 3/4 inch



in diameter - the size deemed appropriate for the grasp of the average preschool-aged child to be serviced by the playground. A pulley carrier on a T beam overhead was used to connect the two vertical end-aspects of the pit construction."



"3 Sand and Water Tables

Sand and water are most intriguing to young children. These materials are beyond the restricted reach of children in wheelchairs or of hands that control crutches and are not free to touch - to feel - to make contact. How can these basic materials be presented so that they are accessible to disabled children who cannot experience these or the myriad of other sensations of a normal environment? At graded heights and allowing for insertion underneath of standardized wheelchairs of three different sizes (fitted to children or individualized measurements), water tables are fed by an artificial waterfall - a water sluice - that serves as a diagonal overhead bridge under which both wheelchair-bound and ambulatory children can pass. Sand trays, similarly graded in height, are available for wheelchair-bound children."

"Both the sound and sight of a waterfall are most agreeable sensations - experiences that are outside the normal reach and contact of handicapped young children in an urban community. To provide such experiences, an artificial water sluice was devised with plexiglass partitions to break the water on its path to receiving tables. It was constructed with transparent plastic under surfacing to allow for observation by the children of the movement of the water down the sluice as the children themselves walked underneath the diagonal waterfall."

"Receiving the water directly from the waterfall is a series of graded water trays, custom molded initially in plywood and then coated with fiberglass, each with circular cutouts to surround the wheelchair patient. They are placed at graded heights matched to the specific dimensions of standardized wheelchairs used by young children. Each successive water table is two inches lower than the previous table. The water from one table flows to the next reservoir through a three-inch hemi tube, creating micro waterfalls. The last of the four water table trays has a drain that feeds into one of the several drainage areas on the site."

"Adjacent to the fourth and lowest water table is the first in a series of three sand tables. Again, each of these table trays has a cutout to allow for the insertion of a child in a wheelchair - the design of which has proved to be so effective for our young wheelchair bound patients. (It has been our experience that this structure is a comfortable and inviting one for young children whose balance is precarious as well as for children with no orthopedic difficulty at all.) The design allows the child to be surrounded by the material with which he is involved. And, the accessories that extend his play can be readily available within his limited reach."

"The proximity of the sand and water tables encourages a mix of these two basic materials. Experimentation with combinations of varying proportions of water and sand offers a wide range of sensory experiences - visual and tactile. Changes that occur in one medium as a result of the addition of the second material provoke the types of questions that are, we believe, very meaningful to the young child if he is to be effective as an observer and as a learner. 'What changed?', 'How did it change?', 'What did I do to make it change?', and, hopefully, 'Can I do it again?'"

"4 The Hill and Circle

The last activity area, located at a point farthest from the entrance to the playground, was reserved for an elevated grassed area surrounding one of the large London Plane trees on the site. The gently sloped hill was artificially created. The angle of the slope was 25 degrees ending with a plateaued top surface which itself was bounded by a 300 degree circular safety wall of natural cement. The interior of this wall, which encircled the tree at the same time, formed the boundary and structure of a quiet nook complete with a circular redwood bench Redwood facing was installed on the internal surface of the concrete wall area to add further warmth to this quiet area which was expected to be used for group interaction and socializations when shade of the tree was needed for comfort. (The only other area that had been planned for group seating was a series of redwood picnic benches and table and work benches placed in sites open to the heat of the sun - appropriate for use in spring and fall climates) To differentiate the entrance to the hill circle from the traffic pathways of elastaturf, red brick flooring was introduced for the approach to the nook as well as for the flooring of the redwood area"

"Imbedded in the sod of the grass hill, on the side where the slope was most gentle, was a fiberglass slide pitched upward at the lower extremity to slow down the movement of the child as he arrived at the bottom of the slide Access to this slide for ambulators was aided by handrails attached to the external cement wall that surrounded the hill. The incline was gentle enough at the same time for the youngest crawler to master"

"The hill circle, with its redwood boundary and tree branch ceiling, created a visual atmosphere of serenity which was somewhat discrepant with the jarring sounds of the traffic of cars, trucks, buses, and fire engines on streets that bordered the playground area"

"In an attempt to assist in the understanding of the dichotomy of the tranquility of vision and harshness of sound, a periscope was installed in the hill circle - one that encouraged the child to see over the hill and fence the traffic and buildings of the adjacent city landscape - the source of the sounds of horns and brakes and sirens"

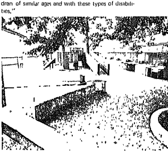
"Wherever possible, redwood was selected as the outside structural material It was used in the treehouses, tables, bench, periscope, the water sluice and hill circle Natural cement was chosen for the structure containing the sand and foam pits All slides were constructed of fiberglass as were the sand and water tables These tray tables had semicircular cutouts to allow for easy access of children in wheelchairs"

"Our intent was to introduce areas of grass, shrubs and flowers. Four large trees were already on the site Their position and the shade afforded by their branches suggested immediately to the designers a natural breakdown of the space into activity areas"

"On the perimeter of the playground, inside a picket fence that borders the site, were plantings chosen for their variety of textures and odors with a scattering of seasonal flowers as well as vegetables and herbs Since it was expected and hoped that children would touch, smell and taste as well as look at all plantings, any shrub that could be dangerous to touch or to ingest during any portion of its growth was automatically eliminated from our selection"

"Surface material had to be selected for the winding pathways that connect all areas Surfacing had to be sufficiently hard to allow for the movement of wheelchairs and vehicles which are pulled and driven by young children with reduced stamina and, at the same time, resilient enough to be safe and non abrasive if new walkers or crutch walkers should fall. Our investigations led to the selection of a composite of rubber and acrylic 'elastaturf' This composition was trowelled on to all concrete paths in a thickness of 3/8 of an inch. In an attempt to visually unify the path and the grass area, elastaturf was used in a muted shade of green throughout"

"The Jessie Stanton Developmental Playground undoubtedly is one of the outstanding projects designed solely for handicapped children age 18 months to six years and points the way in which other facilities could either be designed or redesigned to make them acceptable to and usable by handicapped children of similar ages and with these types of disabilities."



TROUT POND RECREATION AREA FOR THE HANDICAPPED
APALACHICOLA NATIONAL FOREST
Tallahassee, Florida

A Day Use Recreation Area Developed Exclusively for the Handicapped

Summary

Trout Pond represents a thorough effort to understand the recreational needs of the handicapped and to develop a special facility to meet them Psychological factors, and the expressed desires of handicapped organizations, have been given consideration

History

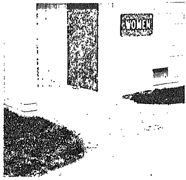
Trout Pond is located south of the capital city of Florida - Tallahassee In 1967, the Tallahassee Handicapped Club asked Mr Joe Riebold, Forest Supervisor of Apalachicola National Forest, if there was not an area in the forest that they could develop for use by handicapped people After further discussions it was decided that the Forest Service would assist in the development of such a facility and Trout Pond was proposed It was felt that such an area for use by the handicapped was needed because general public recreation areas are often not suited for handicapped users and there is reluctance to try new experiences like outdoor recreation in the presence of unsympathetic "outsiders" The final selection of the site was near an attractive pond surrounded by a forest of long leaf pine, cypress and live oak The site has slopes ranging from 1 to 13 percent, the steeper slopes being around the pond The design objective of Trout Pond was to provide recreational facilities for the handicapped, where they could participate with as little assistance as possible

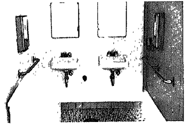
The following are descriptive notes of the facilities at Trout Pond as supplied by the Forest Supervisor's office

Toilet Building and Bathhouse

This facility contains eight flush toilets, four wash basins, and dressing rooms Large routed signs have been attached to the wall and door at the men's and women's entrances so that blind and partially sighted can be certain that they are entering the right side Doors are extra wide (36") and are equipped with delay action closers which take approximately 30 seconds from the time the door is opened until it shuts by itself This allows ample time for the chairbound and those on crutches to clear the door

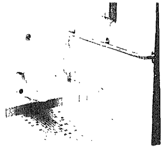
The toilet stalls are five feet by six feet to permit ample room for wheelchair users and attendants, if needed. Sliding doors are used on each of the individual toilet stalls Toilet stools are specially designed for the handicapped and raised twenty inches from the floor This permits easy transfer from a wheelchair Around the perimeter of the toilet stall are grab bars to assist in the transfer from the wheelchair. These grab bars are also located around the wash basins and in the dressing rooms Four benches within each dressing room are twenty four inches wide to permit a handicapped person to lie down so that, if necessary, an attendant may dress him for swimming.





Water Fountains

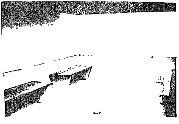
Seven water fountains, each with two bubblers, are located throughout the area. The standard fountain design has been modified by adding a projecting fountain on one side so that wheelchairs can roll under it and reach the bubbler, thirty five inches above the ground. A concrete slab around the entire fountain gives ample access area for wheelchairs and crutches. Also, the difference in feel between asphalt walk and the concrete slab tells the blind user orienting himself with a cane that something different is nearby.

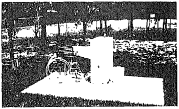


Spray Basin and Swimming Pool

A play area consisting of a shallow basin with a spray jet in the center has been constructed adjacent to the pool. The basin slopes gradually from the side walk without a curb so that wheelchairs can enter easily, and no projecting surfaces are present, for safety in case someone falls. This facility permits water play by handicapped persons with no danger of drowning since the facility does not hold water. Water jets spray about 20 feet high and fall back into the pool. There are various size jets creating a variety of spray patterns so that users can run, roll, or crawl around the spray in a circle, sometimes being showered and sometimes staying dry, to create variety. The fountain also serves as a sound source permitting the blind to orient themselves.

The swimming pool has been designed to facilitate use by almost any kind of handicapped, including chairbound, amputees, blind, arthritic, poorly coordinated, etc. A ramp leads down the right side of the pool on an 8 percent grade for wheelchair users. A person who walks on crutches or the poorly coordinated or arthritic individual will use the steps leading down the left side of the pool. The steps, which have four inch risers and 18 inch wide tread, also can be used by individuals without

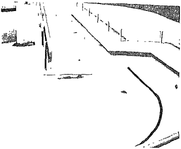


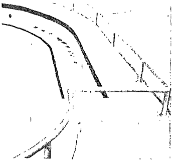


legs who can walk on their hands and bounce down the steps into the water. It ends at a depth of 2¼ feet where a level portion will permit the handicapped user to float from his wheelchair. Maximum depth of the pool is four feet on the long axis of the pool permitting swimming by those who can. For those who merely want to sit and relax, a bench has been built into the side of the pool at the end of the ramp and steps to permit the visitor to sit with the water slightly above his waist without danger of sinking off into deeper water. The pool was designed so that no point within the pool would be over 12 feet from the edge. This permits supervision by attendants in case trouble develops. Handrails are used along ramps and steps, and a rail has been added around the pool to prevent wheelchairs, the blind, etc., from inadvertently falling in.

Sun Protection

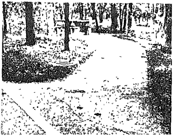
It was found that a handicapped person does not get out into the sun as often as non handicapped people and is more sensitive to the elements. To shield some of the sun's intensity from the pool area, a sun shade was developed. From a large metal pole at one corner of the pool a nylon covering is stretched out over the pool surface. It is held in place by cables that stretch from the pole to various hooks located around the pool's edge. The effect that is created is like a parachute suspended over the pool.





cnic Tables

he tops on the tables have been raised three inches 31" to underside of top) to permit the arms of wheelchairs to roll underneath. The bench on each ide has been divided into two segments to permit a wheelchair to sit in the middle between the benches nd two other chairs at the ends, giving it an easy apacity of four people sitting on the benches and one in wheelchairs. In addition, a large concrete lab has been poured around each table to permit oom for traffic by handicapped users in wheelchairs, rutches, or those with poor coordination.

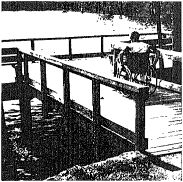


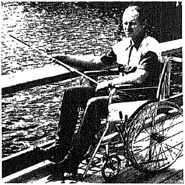
Fishing Pier

This facility provides 32 feet of frontage on the lake. The top handrail has been angled to make it comfortable for a person in a wheelchair to rest his arms. Benches have been provided along the backside of the pier so that the attendants for the handicapped persons will have a place to sit. Timbers have been used around the outer edge of the railing to prevent the wheelchairs from going into the water.

Trails

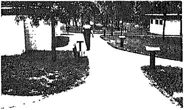
The trail system has been designed with a maximum grade of 5 percent. Grass shoulders along the trail have been designed to slow down the (runaway) wheelchair and also provide a soft landing free of obstructions if the chair should turn over. Handicapped organizations were emphatic in their request that no handrails be used on trails so that the users would have a feeling of freedom of barriers.

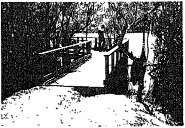




Signage

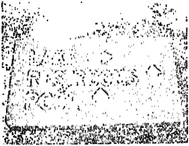
Orientation of the handicapped visitor is a problem, especially for the blind or partially sighted, and also for the chairbound or poorly coordinated individual who does not want to have to search out the facilities because of the physical effort involved and inability to cut across the grass if he takes the wrong trail. Signs have been placed at all trail junctions with the exception of those leading to individual picnic tables. Large routed letters have been used to permit the partially sighted to read the material. Many of the blind can read the message by running their fingers around the letters. The signs have been placed at a low level to permit those in wheelchairs to read them. On the upper left hand corner of each sign the same message spelled out in letters is repeated in braille. Small roundheaded tacks form the braille letters. To the unobserving eye these braille messages go unnoticed but to the forewarned blind person who can read braille, this message can immediately be found.





A system of yellow plastic strips about 1/8 inch thick and 6 inches wide has been applied to the pavement to serve as a guide for the totally blind. The strips are readily discernible by the blind individual's cane or foot, but create no barrier to other users such as wheelchairs. Symbols have been developed for use throughout the area. The blind normally guide themselves by tapping first on the pavement and then on the grass shoulder. Two short strips of plastic placed perpendicular to the line of travel indicate a direction sign which can be located by feeling with the right hand adjacent to the trail.

A white line has been painted down the center of the trail for use by the partially or "legally" blind. Many of these individuals can differentiate the black and the white even though they do not have enough vision to know whether a person they are meeting is a man or a woman.



Parking Facilities

The parking lot has been designed to accommodate 33 cars and 3 buses. A bus unloading area has been provided between the parking lot and the bus door. Adjacent to the bus unloading area are asphalt landings sufficient for 25 wheelchair users so that the attendants will have room to unload all of the patients before beginning to distribute the individuals throughout the recreation area.

Individual parking spaces for cars are a minimum of 12 feet wide, permitting ample room for unloading between adjacent cars. No curb is present between the parking spot and the sidewalk that runs the perimeter of the parking lot, so that once in the wheelchair, the person is free to move on his own. In addition, all parking spaces are on the outside of the parking lot so that no one has to cross the center area of the parking lot.

WILL-A-WAY RECREATION AREA
FORT YARGO STATE PARK
Winder, Georgia

A Camping and Recreation Area for the Exclusive Use of the Handicapped

Summary

In planning a camping and recreation area for the handicapped, considerable thought was given to the varying needs of those with different handicaps, and to the common requirements of all

Goals

Will-A-Way Recreation Area was built by the State of Georgia and was partially funded by a grant from the contingency reserve of the Secretary of the U S Department of Interior Completion of the project was in 1969.

The objective of Will A Way is to provide a recreational facility for the handicapped and their families It is hoped that the disabled person will be able to pursue recreational goals with as much independence and freedom as his disability permits

The question, "Why separate the disabled?" has been answered by the Georgia Park Department in the ICRH Newsletter Volume 3, Number 9, May 1968 (Information Center, Recreation for the Handicapped Southern Illinois University, Carbondale, Illinois)

"Efforts within the medical and therapeutic professions have been to lead those individuals with handicaps toward an acceptance of their disability and toward a full integration into society.

"The Georgia Department of State Parks recognizes and accepts this as the ultimate desirable goal of rehabilitation programs for the handicapped At the same time, it recognizes that there are many among the disabled who have not arrived at the point where they are 'at ease' with their society They are, in fact, very conscious of their disability They feel conspicuous because of it. They are all too often the individuals whose physical, social, and outdoor recreational opportunities suffer the most. Because of their self consciousness they withdraw from taking full advantage of their recreational opportunities

"The object of the separate facility for the handicapped, then, is to 'screen out' those large number of persons who, because of their physical abilities and because of their normal human curiosity, make a disabled participant feel uncomfortable because of his disability. For if our participant can be made to feel more comfortable - or less self-conscious - he will be more likely to take advantage of his opportunities to play, fish, swim, bask in the sun, and to stretch his limbs and senses in the great out of doors "

" it is expected that many who come only to the specialized facility for their outings to begin with, will grow into a fuller use of their bodies, a feeling of greater confidence in their physical abilities, a lesser feeling of self-consciousness, and a renewed desire for more outdoor recreation When these things happen to an individual, it follows that he will become encouraged to participate with the able bodied citizen, and will no longer need the protection of the separate facilities "

The recreation area provides facilities for the handicapped in three ways 1) Group camping, a complete living and program oriented facility, 2) Day use area, to accommodate daily visitors and provide activities such as swimming, picnicking, boating, fishing and nature study, 3) Family cottage area, vacation-style cottages available to handicapped persons and their families on a rental basis

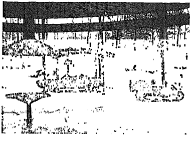
The facility is located on a finger of Fort Yargo Lake separated from the other state park facilities The group camp area is separated from the day use area and family cottage area by the lake A fishing bridge spanning over the lake connects the two areas.

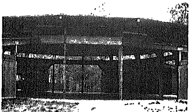
Day Use Area

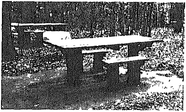
The day use area consists of a large circular structure housing a visitors center, bathhouse, concession stand and a large covered game area, paved with concrete Centrally located in this open area is a raised fire pit

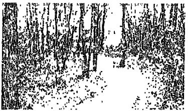
The picnic area is served by a parking lot constructed without curbs Paved walks lead from the parking lot to individual picnic areas consisting of a table, grill and trash receptacle Each table is located on a paved surface and provided with short benches centered on each side of the table. This allows room on each side for a wheelchair

A nature interpretive trail leads from the main center of activity, along the lake, through the upper marsh areas of the lake and into a pine forest At intervals along the paved walk signs are placed to explain certain features of wildlife or plant life The signs are constructed of wooden posts with a flat piece of wood approximately 8" × 8" nailed to the top At tached to this wood is the description of the feature being observed. It is written both in letters and braille It was found, however, that the plastic pieces on which the words and braille were typed could be easily removed and frequently were This makes the trail unusable as far as nature interpretation is concerned.

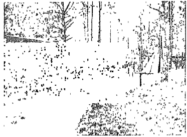


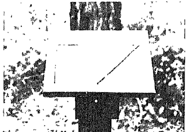




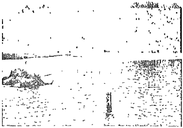


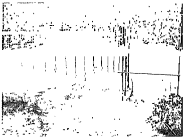
There are two swimming areas on the lake, one next to the day use area and one on the group camp side of the lake The beaches consist of a large sand area with a paved walk on the upper edge of the beach The walk leads from the bathhouse to the water's edge where it enters the water forming a large arc until it reaches a depth of approximately three feet Along one side of this path as it enters the water are metal posts spaced at intervals of about five feet Attached to these posts is a railing The handicapped individual can grasp this railing and gradually enter the water This provides support and security as he works himself into the water This also helps guide the wheelchair user to assure that he stays on the paved surface

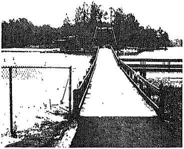




As mentioned earlier, a bridge serves as a connection between the group camp and day camp areas. On one end of the bridge is a bait and tackle shop and rest rooms, and on the other a stage, rest room facility and boat launch area. Here, flat-bottomed boats can be rented and pontoon boats provide safe easy access for wheelchairs. The center of the bridge is wider to provide room to sit or fish. A sun shade structure is provided in this area for protection of sensitive skin.



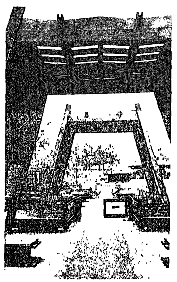


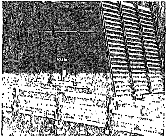


Group Camp Area

The group camp area consists of a central dining hall, assembly building, a swimming pool, camper cabins and program buildings. All of these facilities are served by an asphalt walk system. Small plastic braille signs are attached to each sign identifying the various buildings.

At both the visitor center and dining hall a unique system of unloading a bus is provided. A depressed area receives the bus as it approaches the building. The bus pulls up to a retaining wall in this depressed area as close as possible. The bus door is then opened and a plank is placed at floor height which bridges the gap between the bus floor and ground surface. The wheelchairs are then rolled out of the bus across the ramp/bridge structure and onto level ground.





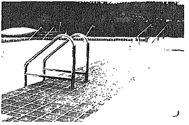
Special Considerations

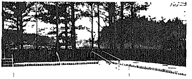
In a discussion with Mr. William B. Holland, the architect for Will-A-Way, some of the problems of designing such a facility were discussed. "The problem we encountered was what type of facilities should be provided for the disabled. Some, of course, are so restricted that they are not able to do much more than just sit on a bench and observe. But even those should be accommodated. In talking to thirteen different handicapped groups we were told that the natural and unanimous attitude was that disabled people like to do the same as everybody else. Some facilities have to be modified so that they can participate. They want to be able to talk and converse with people about the same thing that other people are talking and conversing about so therefore, they want the same thing."

The walks were designed primarily for the use of wheelchairs. Those who are ambulatory are encouraged to go anywhere and not just remain on the walk system.

All of the standard barriers that are mentioned in federal publications (no curbs, no-stairs, no nosing and extending handrails beyond landings) were considered and incorporated into the design. "We found, most interestingly, that for the most part it is not expensive to accommodate the disabled. The only area where we have found additional expense was using ramps instead of stairs because the ramps naturally are going to be more construction." "For the most part, it's not any more expensive, it's just a matter of knowing what to do."

A lot of study went into the treatment of the swimming pool As stated by Mr Holland, elaborate designs of railings, warning devices, curbs, etc , were considered in an effort to make the pool as safe as possible When these designs were discussed with the handicapped people, it was found that one safety device, intended to serve one type of disability, acted as a barrier to another disability For example, a railing around the pool intended to stop a wheelchair from accidentally rolling into the pool was a hazard to a blind person who might trip over the railing The final decision was to make the pool edge as simple as possible A four foot wide strip of tile was placed around the pool edge to serve as a warning that a hazard existed. As a carry over from the pool design, a criterion was set up to use a texture change at all areas of hazards. The key throughout the facility is tile surfacing When a person enters the camp he is simply instructed to watch for the tile surfaces and at that point there is a hazard, be it a door, a sign or whatever The person is then alerted and on guard for any possible hazard

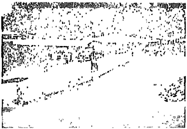


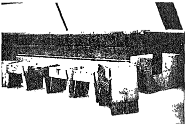


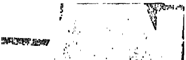
In designing the camp fire areas it was felt that open fires were a must since this is a camp area and open fires are something expected in a camp facility To eliminate the hazard of accidental burning, the fires are raised from the ground and placed on a metal hearth resembling a funnel, the pointed end of the funnel being the support secured to the floor They are high enough to prevent falling into, and the funnel shape allows the lower limbs of a person in a wheelchair to approach the fire and not get burned

In order to accommodate all the varying heights of people, adjustable counters and tables are provided A counter height convenient to a wheelchair user may not be convenient to a person seated in a chair or standing To handle this varying height, counters, shelves, etc , are made to be adjustable A stackable stool was also developed to overcome the varying height problem A small child can use a lower stool than an adult The stool is designed in such a way that it can be stacked one, two, or three high to reach the desired height

The entire layout of the facility was kept as simple as possible This was done in an effort to eliminate any confusion as to orientation and location of different facilities When the basic design for the group camp areas was finished, someone mentioned that it resembled the shape of a tulip So, when a blind person is first oriented to the camp he is told that the layout of the camp resembles the shape of tulip and that his cabin is at the tip of the leaf and the swimming pool is at the base of the flower with the bridge being the stem Immediately the person can orient himself to his surroundings and can go on to experience the exhilarating feeling of independence and freedom







PINE GLEN CAMPGROUND
Mammoth Lakes, California

Summary

The objective of the Pine Glen Campground is to accommodate the handicapped in recreational activities similar to those of the able bodied. A campground, fishing pier and nature trail were designed to be used by the handicapped with little assistance. Modifications and differences have been played down.

Planning and Administration

Mammoth Lakes Recreation Area is located high in the Sierra Mountains of California near Yosemite National Park. Although Mammoth Lakes is located 325 miles from Los Angeles, it is a popular recreational area for residents of that area. The Pine Glen Campground project (which was formerly called Mammoth Lakes Campground for the Handicapped) was initiated by personnel of the Mammoth Ranger District of the Inyo National Forest.

When the Mammoth Lakes Ranger District personnel first discussed the handicapped facilities, two concepts were considered: (1) to construct integrated facilities to accommodate both handicapped and non handicapped or (2) to construct separate facilities for use by the handicapped with their families and by groups of handicapped people with their families or friends.

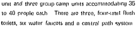
The second concept was chosen for Mammoth Lakes. It was felt that a separate facility would be easier to administrate and the only way to assure space for the handicapped during the heavy-use times. Additionally, raising funds for the project required a special appeal to interested parties, and promoting a project to serve only the handicapped has that type of appeal. Raising funds for facilities for everyone including the handicapped is more difficult.

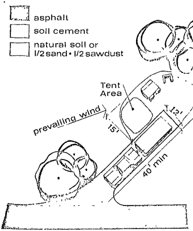
Campground

Following the criteria outlined above, the campground was designed. Access to the site is controlled through the Visitors Information Center, which is adjacent to the campground. Campsites are secured by reservation only, and close control over the area is maintained. The site is adjacent to the regular camping facilities and on a relatively level section of ground. At the entrance to the campground a sign placed in the center of the road states that this area is to be used by special permit only and to inquire at the Visitors Information Center. The international access symbol is also displayed. This is the only indication that the area is for use by the handicapped.

There are 16 single family units, one double family unit and three group camp units accommodating 35 to 40 people each. There are three, four-unit flush toilets, six water faucets and a central path system. All the parking spurs, paths and campsites are a hard surfaced soil cement that is kept clean by occasional sweeping. The road and large group camping parking areas are asphalt.

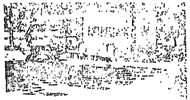
Each campsite has a table and fire grill located on the hard surfaced soil area.



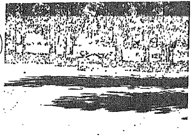


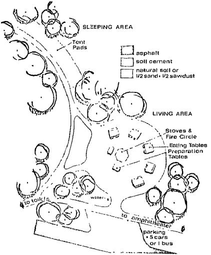
SINGLE FAMILY UNIT

The tables have one section of bench cut out wide enough for a wheelchair The grill is of adjustable height and rotates 360° The parking spur adjoins the hard surfaced area, which allows easy maneuvering for the wheelchair and permits use of truck campers or trailers in conjunction to the table and grill



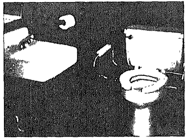
The group camping facilities have several grills and tables. In addition, there is a fire ring It is of circular construction, about five feet in diameter and built up off the ground about two feet



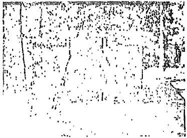


GROUP UNIT
(25-30people)

The camp units are spaced a little closer together than the Forest Service standard in order to encourage togetherness Vehicle barriers are not used, so as to eliminate the hazard of blind people tripping over them and because of the close supervision of the area



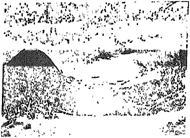
The restrooms have level entrances, wide doors and grouted signs near each door Each unit of a four-unit building has a flush toilet, wash basin and mirror. Only cold water is provided at the basin A delayed push button operation controls the water flow. Ample room is provided for maneuverability of the wheelchair The toilet is equipped with grab bars mounted on the toilet unit, Because each unit is complete in itself the person is provided as much privacy as he would have at home. Propane lamps provide the night lighting inside and around the rest room This type of light provides soft, low lighting in concord with the camping experience, which an electric light would not provide.

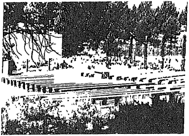


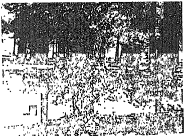
There has been a concerted effort to make the camping area for the handicapped a low-key experience There are no large signs declaring that this is a handicapped area, that it is different from the other facilities As mentioned earlier, the only clue that this is a facility for the handicapped is the international symbol of access displayed at the entrance One of the reasons the name of the campground was changed from Mammoth Lakes Campground for the Handicapped to Pine Glen was an effort to play down the word "handicapped "

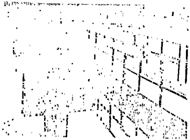
Fishing Pier

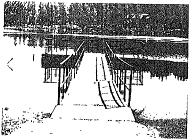
Several miles away from the campground at Twin Lakes, a fishing pier and picnic area for the handicapped has been provided From the parking lot a soil cement path leads to the water's edge and the pier The pier is constructed of pontoons and wood planking and extends out from the shore approximately fifty feet A pipe railing extends entirely around the pier, and a straw type matting is secured to the wood decking The latter provides a non slip surface when the boards become wet The end section is about 10 feet wide and 18 feet long, ample room for wheelchair turning. The only problem with this design is the height of the railings The top rail is about the eye height of a person sitting in a wheelchair. He has to look either over or under the railing

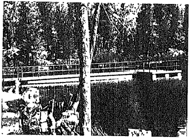




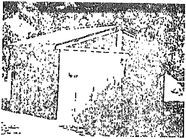








A pit type toilet is provided in this area for use by the handicapped while fishing or picnicking. Wide doors and level approaches are provided. A grab bar of pipe is provided on either side of the toilet



SCENTED GARDEN
MISSOURI BOTANICAL GARDEN
St Louis, Missouri

The Scented Garden at the Missouri Botanical Garden (Shaws Garden) in St Louis, Missouri, was started in October of 1971 The Garden came about through discussion with a potential donor who wanted to set up the garden as a memorial After arriving at a figure for the donation, the staff of the Missouri Botanical Garden had plans drawn up for this specific garden The beds are approximately 32 inches above ground level, making it convenient for the blind person to be able to feel the plant Beds were set up with the various herbs or foliage plants with emphasis on taste and touch In planting this garden the staff has used mostly herbs that are common to the Midwest that are used in cooking This is felt to be an added element that is appealing to the blind person A few other plants were added for texture The garden is currently used by the School for the Blind in St Louis, as well as by other residents of the city who are blind The garden is labeled in braille with the names of the plants and a description of the use of the plant There are also signs giving the name of the plant to sighted visitors Labeling is not a problem in that the braille labels are made at the School for the Blind and can be changed whenever needed

The round bed in the center of the design is being developed as a bird bath which will have a small amount of water trickling through it, which will add another area of interest The background around the bed is planted with various shrubs noted for their fragrance when in bloom or in the case of the magnolia for the leathery texture of the leaves. The ground surrounding the bed is covered with a mulch to give it a soft texture when walking on it. If the area were one where wheelchairs would be used, then the staff felt that a hard surface could be put in Currently, mulch is adequate because the material does press down fairly well The staff is interested in using some of the herbs, particularly the thymes on the ground so that people walking over it will get the scent as the stems and leaves are crushed At the present time this has had rather poor success due to the heavy traffic over the area early in the season The approximate cost of this garden was $12,000 It has an automatic watering system in the beds which does cut down to a certain extent on the maintenance The staff felt that the garden has generated a great deal of interest, both locally and nationally, and they have received numerous requests for more information

GARDEN OF FRAGRANCE
STRYBING ARBORETUM
GOLDEN GATE PARK
San Francisco, California

As one enters this garden of fragrance he is invited to touch, smell or taste the plants that are there Tucked away in a corner of the Arboretum, the garden goes almost unnoticed by the passing visitor A 30 inch stone wall salvaged from an old Spanish monastery forms the raised planters of the garden and acts as a guide to the blind

Mounted on top of the wall are small plaques with braille inscriptions describing the type of plant at that point in the wall In some areas the plants are hanging over the rock wall so that if a blind person were guiding himself along the wall his fingers would run across these plants or he would brush against them. About 20 plaques along the wall identify specific plants It is obvious that the visitors take advantage of the closeness of the plants Around each sign the plant is broken and worn back where it has been touched and pieces broken off.

The path is approximately 200 feet long About halfway through the garden a pool of water comes within reach of the visitor. The sign suggests that the visitor wash his hands of the scents he has accumulated thus far and freshen the fingers for more explorations of plants on the return trip

At the end of the walk, the path widens out and a planter is placed in the center Benches next to the planter provide a resting spot where one can hear the sounds of the garden and smell the various fragrances of that particular season

The plants used in the garden were selected for their fragrant foliage or flowers A list of the plants identified with braille signs shows the great variety·

Basket of Gold, Alyssum saxatile--a spreading perennial with golden flowers

Scented leaved geranium, Pelargonium tomentosum--27 varieties are used in this garden

Pinks, Dianthus x allwoodii--one of the oldest cultivated flowers A cross between garden pink and the perpetual flowering carnation.

Lavender, Lavandula officinalis- very aromatic Flower spikes are dired and used for sachets.

Stocks, Mathiola incana -annuals Grown from seed sown in the winter or early spring

Mignonette, Reseda odorata--Native to North Africa An annual with minute flowers and fragrance

Garden sage, Salvia officinalis- used medicinally and as an herb for thousands of years Native to Mediterranean area

Chamomile, Anthemis nobilis--tea was used in Europe as a cure for stomach disorders Leaves have a strong odor when crushed

Nepeta, Nepeta mussinii--related to the Catnip, but much prettier with grey leaves and blue flower spikes

Shore Juniper, Juniperus conferta prostrate Juniper

Requien mint, Mentha requienii--a small leaf mint that grows flat on the ground

Swiss Mountain Pine, Pinus mugo dwarf pine that stays small.

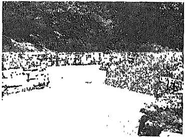
Xerba Buena, Satureja douglasii a minty fragrance when pinched Native to San Francisco Bay area

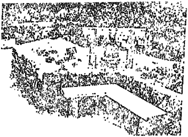
Rosemary, Rosmarinus officinalis- once used for purification in hospitals, to flavor foods in drugs, liniments and hair lotions

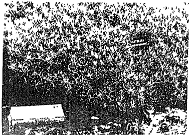
Lavender cotton, Santolina Chamaecyparissus--a herb with the scent of camphor. Used as moth repellent

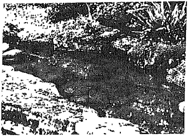
Lamb's ears, Stachys lanata -leaves of this perennial are white, wooly and soft to the touch

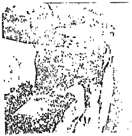
Dwarf or Cupid Sweet Peas, Lathyrus odoratus- a bushy plant two feet high





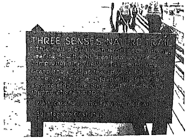




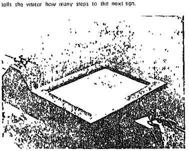


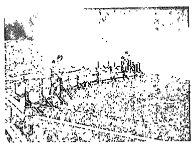
THREE SENSES NATURE TRAIL
FOUNTAINS PAINT POT SCENIC DRIVE
LOWER GEYSER BASIN
YELLOWSTONE NATIONAL PARK
Wyoming

At one of the scenic stops in Yellowstone Park a short trail designed for the blind has been developed The site is located at Firehole Lake which is about two miles off the main park road A simple sign at the main highway declares only Three Senses Nature Trail The only time the blind or braille is mentioned is on the sign as one begins the walk.

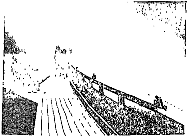


The trail begins on a boardwalk that surrounds Firehole Lake The boardwalk is about five feet wide with a rope guide rail on one side and a substantial railing on the other with a guide rope suspended above the top rail. At intervals along the walk the guide rope is interrupted by an interpretive sign The sign is made of thin aluminum secured to a piece of wood and bordered by a wood frame, the frame being a means of securing the sign from vandals who tend to pry the signs from their backing Each sign tells the visitor how many steps to the next sign.

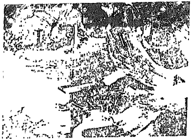




The trail follows the boardwalk for a distance of approximately 200 feet where the visitor can smell and feel the sulfur and steam rising from Firehole Lake. The trail then leaves the boardwalk and progresses up the side of a nearby slope. At stops along this portion of the trail the signs explain some of the wild life that inhabit the area, some of the trees common to the area and the life and death cycle of the trees The signs are set close enough to the trees to enable the visitor to touch the bark and feel its size This portion of the trail is about four feet wide and is constructed of compacted earth.

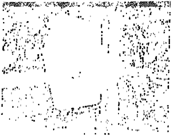


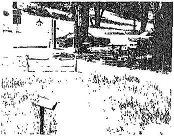
As far as could be determined, the trail was not intended for use by wheelchair visitors but could easily be adapted to such use With the exception of a grade change on the far side of the lake which involved two steps, the boardwalk could be used by wheelchair users. It would, however, be more adaptable to the wheelchair if the planking on the boardwalk ran horizontally to the line of traffic rather than parallel The unpaved portion of the blind trail could be negotiated by wheelchairs with only minor assistance.



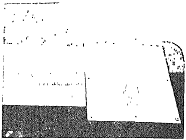
WHISPERING PINES NATURE TRAIL
SAN BERNARDINO NATIONAL FOREST
California

Whispering Pines Nature Trail is located on Highway 38 east of Redland California The San Bernardino National Forest recreation site is located near the trail area Several private (church and institutional) camping facilities are also nearby Directly across the highway is the Ponderosa Trail, a 45 minute self-guided nature trail Entrance to the trail is from a parking lot directly off the highway A split rail fence divides the trail from the parking lot and benches are placed at the entrance

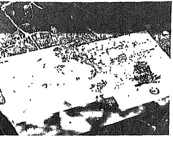


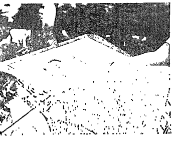


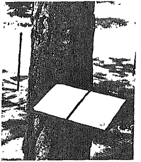
The sign placed at the entrance reads thus "Welcome to Whispering Pines Nature Trail You are now at an elevation of 6,200 feet in the San Bernardino National Forest So that the visually handicapped can also enjoy the wonders of nature surrounding us,



messages along the trail have been transcribed in braille The trail is constructed with a guide rail which starts on the left side At sharp turns it is on both sides As you approach each message you will find three knots in a row The trail is about 3,600 feet long and will take about one hour and fifteen minutes to walk We hope you will enjoy this adventure in nature. Remember that you are entering the National Forest area so no smoking until you return to the parking lot The first sign along the trail is a narrative explaining that in 1969 this trail was the site of the filming of a Lassie television show The show depicts a blind child learning to enjoy the smells and sounds of nature "







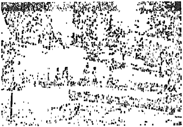
The guide rail is made of narrow nylon rope It is stretched tight between iron posts that are approximately 36 inches high On the top of each post is a cap and eye in which the rope passes through Each post is spaced about 20 feet apart The rope will change from one side of the trail to the other, depending on which side the interpretive sign is located and usually on the downhill side of the path When the rope changes side the user will be forewarned from the preceding sign At some points the rope is on both sides of the trail, mainly to avoid confusion at sharp turns

The trail itself is compacted earth about four feet wide and covered with fallen pine needles and the natural vegetation of the forest flour The trail was not intended to nor will it accommodate wheelchairs The grades on the trail are gentle enough that a person with braces or crutches could possibly negotiate it

At each interpretive point a sign, both in braille and letters, describes some aspect of nature or wildlife The signs are 36 inches high, set on a metal post and secured to a 1/4 inch metal plate, tipped at an angle for easy reading The lettered sign is on an aluminum plaque with photo engraved letters and graphic drawings About three feet before each sign three knots tied in the rope warn the user that a sign is near The rope is attached to the underside of each sign, guiding the user directly to it

The signs explain some of the happenings of the forest and the wild life that live there At several points the use of one particular tree is explained One such sign reads thus "Forest of Giants Behind you is a large tree Put your arms around this giant It is a Ponderosa Pine, more than 46 inches in diameter and 12 feet in circumference There is enough wood in this pine to build a small two bedroom home Ponderosa Pine has large, irregular, brownish plate-like sections on its bark They are quite evident on this tree The bark is usually three or four inches thick, especially near the base This tree produces cones which you may find along the trail A section of this Ponderosa Pine has been cut out where pine gum has seeped through Touch it and feel its stickiness On your right hand you can feel the needles on the Ponderosa Pine You will notice that there are three long needles in a bundle This is characteristic of the Ponderosa and Jeffery Pine The rope will be on your left hand to the next stop"

Another sign explains trail construction "A few feet ahead in the trail we will make a sharp turn to the right This is called a switch back. It is used in trail construction to maintain a pleasant grade and to prevent soil erosion The rope line will be on both sides of the trail for the entire switch back and then will continue on your left"

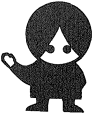


At the highest point on the trail, which rises to the crest of a hill and then continues down the other side, a log has been placed beside a sign "Stop and Listen Beside this sign is a log to sit on One of the sounds you may hear on this ridge top is the wind whispering through the lofty pine trees This sound varies with trees of diffrient heights How tall do these trees sound to you? These trees average 710 feet in height You may also hear the sound of various birds which live here, such as a flicker or the robin. You might also hear a squirrel chattering as he runs up to the nearby tree gathering his winter fruit supply A harmless lizard might be running through the dry leaves and needles on the forest floor catching insects for today's meal. You will notice that the forest is a very busy place Much like the community you live in."

At a point on the trail where the sun is not shielded by the towering trees a lesson on direction is given both in braille and letters "Where are you? Do you know where the sun is? The top of the sign is toward the South, with the sun generally about in front of you It is easy to find which direction when you face the sun. Your right hand generally will point to the West, your left hand to the East If you are here in the morning when you face the sun, your left hand will point to the North If you are here in the afternoon, your right hand will point to the North, when facing the sun Remember, too, the sun always rises in the East and sets in the West"

The trail brings the visitor back to the parking lot where it ends

NATIONAL CHILDRENS FOREST
SAN BERNARDINO NATIONAL FOREST
California



Summary

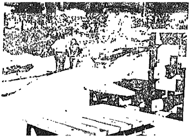
An interpretive trail was designed for the use of all children, including the handicapped The blind have been given special consideration The design is simple and successful

History

Early one morning in November of 1970, violent winds blew embers from a campfire into a patch of dry brush. From these tiny sparks a devastating fire consumed 53,000 acres of forest land in six days Soon after the last sparks died out, men began reseeding the barren slopes and planting small young trees where large giants once stood

In 1971 Hunt Wesson Foods, Inc , agreed with the Forest Service to pledge the cost of a young tree for each label of one of their products returned to them This supplied a large number of the trees to reforest this area. Many young people were involved in this replanting program, and the Cooperative Outdoor Environmental Program was conceived This concern prompted an idea new to the National Forest system —the National Children's Forest—a forest which would reflect man's concern and his ability to give nature a helping hand, The San Bernardino Forest was selected as one of three sites for a National Children's Forest and interpretive trail.

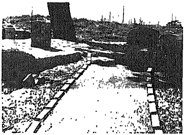
It was decided from the beginning that this interpretive trail was to afford all visitors the opportunity to venture through the forest



Trail Construction

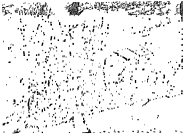
The trail is approached from the parking lot via a rough paved patio area where an entrance and descriptive sign and water fountain are located One unfortunate aspect of this area is that a person is required to step up from the parking lot to the paved area approximately six inches This is the only access to the trail

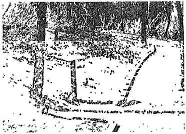
The trail is asphalt covered, four feet wide and bordered on both sides by 16 inch long 2 x 4 s secured to the asphalt trail At each interpretive spot the asphalt is replaced by a strip of heavy exposed aggregate concrete

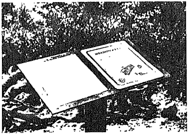


Points of Interest

Each sign is mounted on a tubular steel post, 30 inches high and 1/4 inch iron plate approximately 12 x 16 inches On this, a descriptive sign of lami nated plastic is secured. The wording reflects a child's understanding, and colorful graphics help illustrate the idea. Next to this sign is a thin metal sign with the same story, typed in braille. The signs are very clean and neat looking and appear to resist vandalism.







The trail follows through various areas of the des-
royed forest and interprets the old life destroyed by
he fire and the new life emerging from the burned-
ver earth

t several points along the trail the visitor is en-
ouraged to stop and feel the burned-out tree stumps
nd the cavities where the forest wildlife can make
eir homes

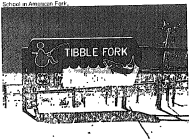
ird houses have been placed on trees along the trail
o encourage the birds back to the area Every ef-
ort is made to show the concern man has for his en-
onment and how he can take positive action to in
uence nature

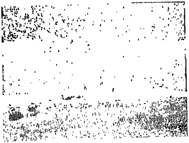
TIBBLE FORK FACILITY FOR THE HANDICAPPED
UNITA NATIONAL FOREST
Provo, Utah

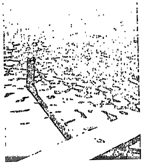
Summary

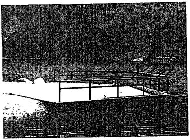
It was necessary to overcome a variety of topographic problems and create a new design for a fishing pole support in order to build this recreation facility for the handicapped

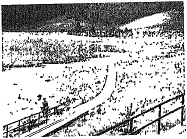
Tibble Fork Reservoir, located in the Unita Mountains, is a beautiful little lake well stocked with fish At this reservoir, the U.S. Forest Service has provided a recreational fishing area accessible to the physically handicapped Norman Malone, U.S. Forest Service Landscape Architect, was the designer Located within a half hour drive, the reservoir can serve the Utah State Hospital in Provo and Utah Training School in American Fork.



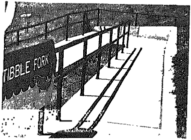




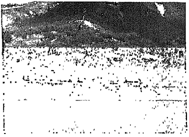




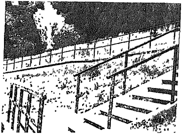
A concrete walk takes the visitor from the fishing pier to a system of ramps that work back up to the parking area and rest rooms.

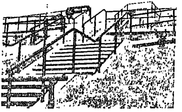


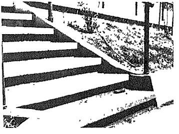
The ramp is a series of switchbacks working up the side of the hill with a small retaining wall on the uphill side of the ramp. A thirty-two inch high railing is placed on the downhill side The ramp is broken at approximately thirty-foot intervals with a level landing which provides a rest area for the wheelchair user as he makes his way up

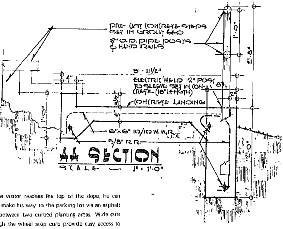


There is also a series of steps to provide access to the water's edge for those who do not need to use a ramp Because of the design of these pre cast steps, there is a 1" overhang on each tread This can be a problem to a person who wears leg braces or someone who has difficulty in lifting the leg and foot straight up, causing a dragging motion of the leg and foot With a stair such as this, the toes of the shoes tend to catch on the overhang

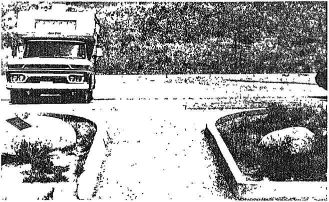




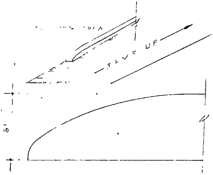



PRE-CAST CONCRETE STEPS SET IN GROUT BED
2" O.D. PIPE POSTS & HAND RAILS
3' - 11½"
ELECTRIC WELD 2" POST TO SLEEVE SET IN CONCRETE (18" LENGTH)
CONCRETE LANDING
6"x6" 10/10 W.M.R.
5/8" R.R.
AA SECTION
SCALE — 1" = 1'-0"
1'-0"
2'-8"
4"
8"
2"
1'-0"
2'-0"
3/4"

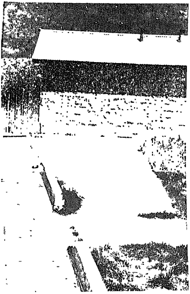
As the visitor reaches the top of the slope, he can easily make his way to the parking lot via an asphalt path between two curbed planting areas. Wide cuts through the wheel stop curb provide easy access to the car for the wheelchair user



The site provided some special problems that have been well-analyzed and solved Because of the nature of the reservoir, the water level fluctuates greatly over the year, from a high level in the spring to a low level in late summer Access to the water's edge became a difficult problem To solve this, the fishing pier was constructed approximately twenty feet out in the water A bulkhead was built and then filled in behind and covered with a concrete slab used as the surface for wheelchairs



ELEVATION
1/4" = 1'



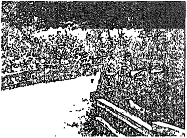
The Pier

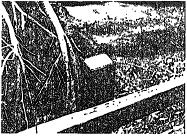
A pipe railing on the bulkhead provides safety for users of the pier The pier is wide and spacious and allows plenty of room for maneuvering the wheelchairs

A special support is provided for fishing poles for those who do not have enough strength or dexterity to hold the pole A metal support with a fork on the end is suspended out from the railing This supports the shaft of the pole A wooden plank bolted to the top railing has holes drilled in it to receive the butt end of the pole In this position, the pole is supported at a good angle for fishing and the user has easy access to the pole when the action begins

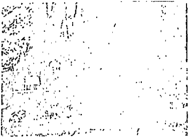
TRAIL FOR THE BLIND
MUIR WOODS NATIONAL MONUMENT
Near San Francisco, California

Located among the giant redwood trees of Muir Woods a small section of trail has been set aside for the blind visitor Approximately 200 feet long, the trail breaks off from the main path It makes an arc through several of the large redwoods and joins back up with the main path The walk area is about 12 feet wide and bordered on both sides by a low split rail fence (as are all the walks in the woods)





The walk is asphalt covered with the needles and debris of the natural forest floor giving it a very quiet and soft feeling. The interpretive signs are approximately 3" x 4" and mounted on the end of a post They are set just outside the rail fence There is no warning or indication to the blind visitor that he is approaching the sign, nor is there any explanation at the beginning of the trail as to where the signs are located It would almost be required that a sighted person accompany the blind visitor to assist in finding the signs and directing him along the path The signs are in braille only and made of thin aluminum tacked to the post



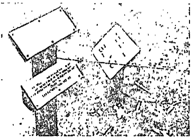
At one point along the walk the fence guides the visitor up to one of the giant redwoods Here he can feel the texture of the tree and get an idea of its size

It is felt that the trail could have been a little longer with a few more interpretive signs and possibly a combination of letter and braille signs so that the sighted person as well as the non braille reading blind population could enjoy the points of interest It is definitely a trail that would require a sighted person to accompany the blind visitor

At the Visitor Information Center thought has been given to the wheelchair and elderly visitor by construction of a ramp alongside the entrance steps

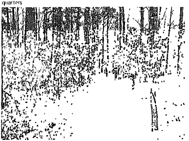
TRAIL FOR THE BLIND
PETERSBURG NATIONAL BATTLEFIELD
Petersburg, Virginia

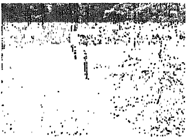
As part of an overall interpretive program at a Civil War battlefield near Petersburg, Virginia, the National Park Service has provided a trail for the blind The trail traverses over a section of forest once ravaged by the force of a civil war



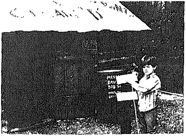
The trail is constructed of compacted earth covered with fallen leaves and pine needles. On the right side of the trail a nylon guide rope is provided The rope is attached to posts spaced approximately 30 feet apart. As one approaches each sign a knot in the rope alerts the visitor of the upcoming sign. Each sign is written in braille and letters The braille is stamped out on thin metal sheets and attached to the top of the rope supporting posts A similar sign in letters and covered with a plastic sheet is attached to the same post, but mounted at a lower height.

The trail interpretation has been established as a two fold purpose It provides descriptions of the nature and wildlife in the area and it also provides a narrative of the Civil War campaign fought in that area The signs point out the trenches dug by soldiers as protection against the enemy It invites visitors to inspect a small log cabin used by the soldiers as living quarters





The trail has been integrated well into the overall program of the park and helps the visitors to gain a better understanding of the human aspects involved in a war such as this as well as an understanding of the natural environment of the forest. The trail was not specifically designed for use by people in wheelchairs but the grades are such and the surface hard enough that a wheelchair could negotiate it without much assistance.



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